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FRACTURES OF THE TUBEROSITIES OF THE TIBIA*

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IN practically every contribution on fractures of the tibial tuberosities, attention is called to the rarity of the lesion. Certainly, these fractures are not met frequently; the total number of cases published from 1852, when Thamhayn[1] reported the first injury of this variety, to the year 1930 has amounted to only 263. (See accompanying chart.) Even if allowance is made for imperfect reports prior to the introduction of the roentgen rays, when this fracture undoubtedly was often classified among lesions of the upper tibial extremity, and even if allowance is made for the possible confusion of the injury with sprains, still the lesion must be considered uncommon.

Possibly it is because this fracture occurs so rarely that there seems to be a general lack of appreciation of its gravity. There is a tendency to regard the fracture as a trivial injury and make no attempt to reduce it. These condylar fractures, on the contrary, constitute definite and serious lesions; they are articular fractures, involving a weight-bearing joint that is subject to considerable strain. Not infrequently, they concern the semilunar cartilage. If the fracture is not recognized early, and proper treatment instituted, the injury may lead to functional impotence sufficient to incapacitate an individual in his particular line of work. Swelling, tenderness, and limitation of motion may persist for months. These fractures practically always interfere with the line of weight-bearing and cause knock-knee and flexion deformity. Weight-bearing with the leg in faulty position leads, in turn, to the development of arthritic changes, a sequela that is common owing to the frequent occurrence of the fracture in adults.

In order to preserve the function of the joint, to maintain the line of weight-bearing, and to obviate sequelae, many of which may be avoided, these tibial fractures must be recognized early, and they must be treated according to the same principles as other fractures.

AGE AND SEX INCIDENCE

Fractures in this region usually occur at about the age of forty, the period in life when an individual is still active, but when the bone resistance is beginning to diminish. The lesion may, however, be found in younger individuals, for cases have been reported of its occurrence during the late twenties and in the thirties.

It is the general opinion that the injury is found almost exclusively in men. Barbilian[36] and Gümbel[44] noted that approximately three-quarters of their cases were men. Such a predominance has not been observed in the series of cases I am reporting; on the contrary, both sexes were affected nearly equally, there being eleven males and ten females.

ETIOLOGY AND MECHANISM

The fracture may be produced by direct or indirect trauma. It is impossible to establish the exact order of relative frequency of indirect and direct injuries, since the mechanism often cannot be determined. In falls, for instance, it may be impossible to judge whether the trauma is the result of the direct violence of the fall, or the result of compression and tearing. One naturally thinks of indirect injury in connection with older patients because of the reduced tonicity of the bone and ligamentous structures at an advanced age. On the other hand, direct injuries have become much more common with the increased use of the automobile, and "bumper" fractures are well known.

Bicondylar fractures are due to forceful traumas, such as falls from a great height, or severe blows directly on the knee.

The external tuberosity is involved more frequently than the internal, in approximately the relation of two to one. This predominance is not surprising in view of the mechanism of the majority of injuries. (See *Mechanism.*) Bicondylar fractures seem to be nearly as common as internal tuberosity injuries.

Indirect fractures are usually the result of a fall; this may be a fall from a great height, or one of only a relatively short distance. In the latter case the fracture is produced when, with the leg in flexion and slight abduction, and with the thigh fixed, there is a sudden twist. Any preëxisting disturbance in statics, as a genu valgum or a genu varum, is undoubtedly a contributing factor.

The chief element in the mechanism of these indirect fractures is compression, to which German operators in particular have called attention. When, in a fall from a great height, the individual lands on his feet with the legs extended, a traumatic force is transmitted through the femoral condyles to the tibial tuberosities.

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This force, which is actually the body-weight, acts nearly in line with the long axis of the extremity, inasmuch as there is little lateral motion at the knee. The tuberosity receiving the force is broken just as a wooden stake is splintered when hit by a heavy maul. The opinion

internal condyle usually received the force on account of its closer relationship to the line of axis of the body-weight. It has been shown, however, that the line of axis very often falls on the external condyle, owing to the instinctive tendency to abduct the leg in falling. In other

CHART OF REPORTED CASES OF FRACTURES OF THE TIBIAL TUBEROSITIES

Author	Date	External Tuberosity	Internal Tuberosity	Bilateral	Total No. of Cases
Thamhayn[1]	1852		1		1
Middeldorpf[2]	1853	1			1
Follin[3]	1867	1			1
Boeckel[4]	1869	1			1
Rivington[5]	1872	1			1
Volkmann[6]	1875		2		2
Duplay[7]	1876			1	1
Heydenreich[8]	1877	3	1		4
Tédenat[9]	1881	1	1		2
Wagner[10]	1886	1	7	1	9
Exner[11]	1888	1	1		2
König[12]	1888		2		2
Oenicke[13]	1888		1		1
Helferich[14]	1890	2			2
Löw[15]	1890-97		4		4
Albers[16]	1894		2	2	4
Finotti[17]	1894			1	1
Demoulin[18]	1894		1		1
Gurau[19]	1895	1			1
Liniger[20]	1895	1		1	2
Porzelt[21]	1897		1	1	2
Molloy[22]	1898	1			1
Schütte[23]	1898			4	4
Bertin-Sans and Jeanbrau[24]	1900		1		1
Fassbender[25]	1901		1		1
Groth[26]	1902	2	1		3
Scherpe[27]	1903	6	9	2	17
Schrecker[28]	1903	1			1
Godlee[29]	1904	1			1
Carling[30]	1905	1		1	2
Dambrin[31]	1905	2	1		3
Jeanne[32]	1905		1		1
Jopson[33]	1905	1			1
Wharton[34]	1905	3			3
Anzoletti[35]	1906	2			2
Chevassu[36]	1906	1			1
Damlot[37]	1906			2	2
Knaggs[38]	1906		1		1
Potherat[39]	1906	1			1
Sonntag[40]	1906	3			3
Riedl[41]	1907	1			1
Lange[42]	1908	1	1		2
Desguin[43]	1909	6			6
Gümbel[44]	1909	2	1	3	6
Manhold[45]	1909	1			1
Meerwein[46]	1909	4			4
Willms[47]	1909	1			1
Zander, 2d[48]	1909	1			1
Chevrier[49]	1910	1			1
Mouchet[50]	1910-11	1			1
Claeys[51]	1911		1		1
Fowler[52]	1911	1			1
Palagi[53]	1911			1	1
Rocher[54]	1911		1		1
Sabella[55]	1911	1			1
Erfurth[56]	1912			1	1
Blake[57]	1913	1	2	3	6
Brehm[58]	1913	1			1
Jones[59]	1913	1	1		2
Lambotte[60]	1913	1			1
Lemercier[61]	1913	9	6		15
Lund[62]	1913		1		1
Burnham[63]	1914	1			1
Demoulin[64]	1916	2			2
Freyer and Connell[65]	1916	1			1
Sever[66]	1916	2	2	2	6
Taparelli[67]	1916	2			2
Bec and Hadengue[68]	1918	1			1
Mauclaire[69]	1918	3			3
Coulomb[70]	1919	1			1
Moons[71]	1919		1		1
Robin[72]	1919			1	1
Jeanne[73]	1919	1			1
Dujarier[74]	1920	1	1		2
Juvara[75]	1920			1	1
Alglave[76]	1921	1			1
Leveuf[77]	1921		1		1
Roberts and Kelly[78]	1921	4		8	12
Soupault[79]	1921	1			1
Péraire[80]	1922	1			1
Barbarin[81]	1923	2		1	3
Bossi[82]	1923	1			1
Labey[83]	1923		1		1
Brocq and Panis[84]	1925	3	1		4
Desgouttes and Ricard[85]	1925	2		2	4
Barbillan[86]	1926	6	3	1	10
Blencke[87]	1926	1			1
Moutier[88]	1927	1			1
König[89]	1928	1			1
Moreau[90]	1928	9	2	11	22
Hoffmann[91]	1929	4	1	9	14
Zielke[92]	1929	5	4	3	12
		130	70	63	263

has been expressed by several writers that the internal tuberosity more often receives the force. A glance at the accompanying statistics, and a study of the anatomy of the tuberosities and the mechanics of the joint make it clear that the external tuberosity is involved more frequently. Wagner[10], who made a careful study of compression fractures, was of the opinion that the

words, the attitude of the fall determines the site of fracture. Some writers claim that this abducted position is responsible for the internal tuberosity's being involved more frequently, in that it causes the articular surfaces on the inner side to draw together. While the abducted position of the knee, as well as the longer internal femoral condyle, might make the internal

type more common, still the transmission of the line of force through the external tuberosity, and the weakness of the overhanging external condyle, even though reinforced by the fibula, counterbalance the tendency.

In bilateral injuries, the force is applied along the long axis of the tibia and fibula, and it is violent in nature. Such a fracture is produced when an individual falls from a staging or ladder, and lands flat on one or both feet.

In all compression fractures some ligamentous tearing probably takes place, due to the exaggeration of a movement or to a twist. Whether there is actual rupture of a lateral ligament followed by compression of the articular surfaces on the opposite side, as suggested by one writer, is questionable.

The mechanism of *evulsion* may explain the production of fractures from trivial falls. Barbilian[86], in attempting to demonstrate this mechanism on the cadaver, found that a fracture could be produced when, with the leg in a certain degree of rotation and abduction-flexion, a blow was struck on the level of the upper extremity of the tibia. Less force was needed to produce the fracture than when the leg was in normal position. It is evident that in exaggerated positions the resistance of the bone is reduced. Barbilian believes that these evulsion fractures are very rare, and that they are met only in adults who have a pathological bony structure, or in the aged with rarefied bony systems. Segond[93] experimentally produced fractures of the tibial tuberosity by simple forced extension in patients with rarefied bony structures. While Barbilian was not able to produce a fracture by this mechanism, one of his cases seems to confirm Segond's experiment.

Muscle contraction was considered a factor in the mechanism by some of the earlier observers, but its effect is uncertain. There are no strong muscles that abduct or adduct the knee. Instinctive setting of the muscles in falling possibly makes the knee more rigid and thereby more susceptible to injury. For instance, a misjudged step, with only the anterior thigh muscle tight, might cause a tuberosity fracture.

Direct fractures are the result of local violence, such as a kick from a horse, a fall on a stair, or the blow of a heavy object. Being struck by an automobile while standing, or being fallen upon while lying down, are other instances. In direct injuries, the force is applied at about a right angle to the long axis of the bone, with the body-weight acting as a secondary traumatizing factor. An injury to produce a fracture when the body-weight is lacking, or when an individual is stationary, must be extremely severe. The external condyle naturally is injured more often from direct causes, as the internal tuberosity is protected by the opposite leg.

ANATOMICAL-PATHOLOGY (Fig. 1)

From the careful study of the architectural structure of the upper extremity of the tibia made by Barbilian[86], it has been shown that the direction of the line of fracture is determined in general by the disposition of the trabeculae making up the bony tissue. In a sagittal section, these trabeculae are separated into two systems, an anterior and a posterior, which cross each other in arch formation. The anterior and posterior trabeculae, located lower down, finish on the opposite faces of the bone, while the higher ones terminate on the articular surface itself. Two characteristics of the trabeculae are brought out by Barbilian: (1) They always cross each other perpendicularly, and (2) they fall perpendicularly on the articular surface. This disposition permits the bone to withstand great pressure. In a frontal section, two groups of trabeculae are seen, one for each tuberosity, which start from the lateral faces of the bone and run perpendicular to the corresponding articular surface. The space between the two groups appears to be occupied by the section of the trabeculae seen in the sagittal view. These trabeculae are bound by other trabeculae that run in a horizontal plane. In a transverse section, the trabeculae show between them little canals, the dimension of which varies according as they are located in front, back, or on the sides.

FIG. 1. Showing fracture of the tibial tuberosity with shearing off of the internal meniscus. (Lee.)

The line of fracture, in following the direction of the trabeculae, is, therefore, usually vertical. In an exceptional case it may be oblique, and, even more rarely, transverse. The direction varies, of course, with the point of termination; the farther it is from the articular surface, the more nearly vertical it is, with a tend-

ency to become horizontal as it approaches the articular surface. In direct fracture the lines exhibit no typical course. Here the picture of the break corresponds to the working force, which naturally shows much difference in strength and direction.

The fracture may be complete or incomplete. The former, in which the entire tuberosity is separated from the rest of the epiphysis, is more serious. The line of fracture in these cases usually begins just outside the intercondylar eminence, but it may also begin on the internal

FIG. 2. Showing genu valgum in a case of fracture of the external tibial tuberosity.

side or between the two tubercles of the spine. The point of termination varies greatly; it may be at or below the level of the fibular head, or the line may descend into the diaphysis. Cases have been reported in which the entire condyle was spread apart and dislocated, with the corresponding femoral condyle hanging between the fragment and the sound part.

The incomplete fracture, in which only a part of the tuberosity is detached, may include all forms, from separation of nearly the entire condyle of the tibia to a simple marginal tear.

In the more severe cases, fissures or cracks radiate anteriorly and posteriorly. All degrees of comminution are possible, the most common being the triangular central prism type.

As to the location of the fracture, one tuberosity or both may be involved, or the tuberosities may be injured in a comminuted fracture of the knee joint, as seen especially following vertical compression fractures. The bicondylar fractures are a combination of a vertical and oblique fracture in the form of a reversed T, or a combination of two oblique fractures in the form of a V or reversed Y.

The displacement of the fragment tends always to be outward and downward, with a tilting of the fragment.

In the majority of cases the displacement of the fragment is slight. Any deformation of the articular surfaces, however, even though a minimum, disturbs the normal relation of the femur to the tibia, with the result of some change in the alignment of the joint. Thus is explained the deviation of the leg into genu valgum or genu varum (Fig. 2). In practically all cases, regardless of which tuberosity is involved, deviation takes place into valgum, due undoubtedly to the predominating action of the biceps. Deformity is much more serious if the injury concerns the internal condyle, which bears the brunt of the body-weight. If the external condyle alone is concerned, the displacement, if slight, causes less disability.

ASSOCIATED PATHOLOGY

Coëxistent lesions are frequently seen. Fracture of the neck, head, or diaphysis of the fibula may accompany a tibial fracture. Fracture of the fibula is more commonly found in connection with an external tuberosity fracture, when the blow is received directly on the upper external surface of the leg. In external condylar fractures of indirect cause, the integrity of the fibula is the rule, owing to its flexibility.

Cases of associated injury of the tibial spines have been reported. In two instances in this series, injury to the tibial spine was shown by x-ray. A fracture of the tibial diaphysis has been observed in connection with a fracture of the external tuberosity, and a fracture of the edge of the external glenoid region in connection with a break of the internal condyle. Fracture of the femoral condyles may occur in an extensive injury, and especially when the traumatizing force is severe and along the long axis of the femur.

The meniscus may be sheared off or displaced between the fragment and the undepressed area (Fig. 1).

It is evident that tearing of the capsule or ligaments may accompany a tuberosity fracture. Popliteal nerve damage is uncommon.

DIAGNOSIS

The history of an injury in which the traumatizing force, usually the patient's own body-weight, is exerted more or less along the longitudinal axis of the lower extremity is of important diagnostic value. If the case is seen before diffuse swelling occurs, inspection usually reveals a prominence on the upper end of the tibia. Increased lateral mobility carrying the leg into valgum or varum is practically always present, and with the leg in position of flexion, in which the greatest instability is shown, it is possible to determine which part of the tuberosity is fractured and displaced (Fig. 2). It is well to make sure that the genu valgum or varum did not exist previous to the accident.

Other objective signs more or less constant

are swelling of the upper extremity of the leg, hemarthrosis, and ecchymosis gravitating down the calf posteriorly and particularly marked in the popliteal groove. The tibia is somewhat broadened in most all cases, the amount depending upon the degree of displacement of the fractured fragment.

Pain and tenderness are not marked, and when present, often cannot be definitely localized by the patient. Pressure on the articular line elicits some pain and tenderness, particularly in the groove at the site of the fracture and over the existing prominence.

Crepitation is present only when the fracture is severe and a bony fragment loose. It is seldom observed by the patient at the time of the injury.

The degree of disability varies according to whether the internal, external, or both tuberosities are concerned, and according to whether the fracture is complete or incomplete. In bilateral cases disability is complete. In internal tuberosity injuries the functional impotence is usually serious, owing to the relation of the inner tuberosity to the line of weight-bearing. In external condylar fractures the patient may walk with small steps provided the fibula remains intact. The disability is less marked when the fracture is incomplete.

The clinical picture in bilateral cases is similar to that in cases of unicondylar fracture, except that the symptoms are more severe. A slight shortening may be present in these cases.

The final word in diagnosis rests with the roentgenogram, preferably with the stereoscopic x-ray picture, which shows clearly the displaced fragment. Comminutions may be obscured by the fractured fragments with their more dense cortical bone, but it is safe to assume that a certain degree of comminution will be present in all the more severe types. Particularly is this true when the fracture starts deep on the tuberosity, and in such cases there are cracks or fissures radiating anteriorly and posteriorly.

PROGNOSIS AND COMPLICATIONS

The prognosis is entirely dependent upon the completeness of the reduction of the displacement, or in other words, the elimination of deformity. Among the factors entering into the prognosis of these fractures, which are truly articular fractures, are the severity of the injury; the presence of associated lesions, such as injury of the meniscus or capsule; the age and occupation of the patient; the statics of the joint before the injury; and the general condition of the individual.

Some permanent damage must be expected in all joint fractures which leave the knee susceptible to strain and the early development of arthritic changes.

In the case of a young, healthy individual, a good recovery as to function, with entire freedom from pain, may be expected following complete reduction of the displacement. If the patient is beyond forty years of age, or if the joint shows arthritic changes, which often occur as the result of occupational strain, some loss of function is to be expected. The functional power will be further hindered if there is any deformity. Particularly is this true in fractures of the inner tuberosity which disturb the statics of the knee-joint.

It is obvious that if the fracture is accompanied by associated lesions, the prognosis must be more guarded.

A complication may be the slowness of repair. Periarticular thickening and induration follow all joint injuries, and apparently result from both the original trauma and the process of reduction and immobilization.

TREATMENT

Theoretically, open reduction should be the method of choice in the treatment of all joint fractures. Particularly is this true in fractures involving a hinge type of joint, to which stability is so important. Open intervention permits more exact approximation of the fragments, thereby allowing early mobilization, and makes possible inspection of the joint for cartilage injury.

Operative intervention should not be used indiscriminately, however, and several factors must be considered before advocating the type of treatment. First in importance is the degree and type of the displacement. In slight or moderate displacement, and especially in deviation of the fragment outward rather than downward, an attempt at reduction by conservative methods is justified. On the other hand, an attempt at reduction by the closed method would be useless in marked displacement or in a displacement downward with comminution.

Other factors influencing the type of treatment are the duration of the period between the injury and the beginning of treatment, the tuberosity involved, the age of the patient, and the presence of arthritic changes. Whatever method of treatment is used, it is more efficacious the earlier it is applied. Open intervention should be done before union has begun. In our cases in which operative reduction had been delayed for varying periods of time, the convalescence was very prolonged, the periarticular reaction severe, and the joint-motion slow in returning. If the closed method is used, it should be carried out at the earliest opportunity, before the blood-clot becomes organized and before tissue infiltration takes place.

Exact reposition is imperative in fractures of the internal tuberosity, in which the least deviation of the fragment downward causes a disturbance of the axis of the leg. Such displacement leads to interference with the gait, makes for instability, and results in a chronic joint-strain.

It is evident that intervention would hardly

be justified in the case of a patient of advanced age, or in a knee definitely arthritic (Fig. 3). Particularly is this true when the external tuberosity is involved, the displacement slight, and the future demands on the knee are not exacting.

In conservative reduction, the writer uses the Thomas wrench, or strikes a blow with a heavy

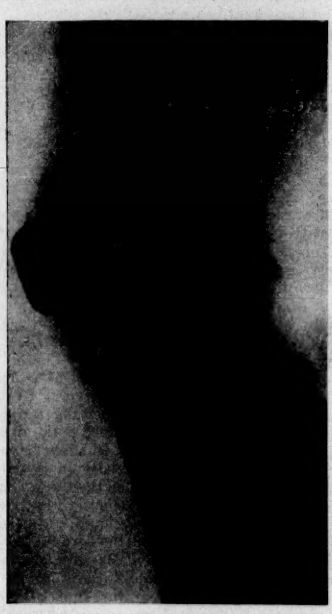

FIG. 3. Showing severe arthritic changes with posterior displacement.

hammer on the displaced fragment, properly protected by felt. The cupped hand is very efficient for driving the fragment upward, and involves less danger to the skin and no actual trauma to the bone. Any of these methods offers a good chance of replacement in deviation of slight or moderate degree, and particularly in outward displacement. If reduction is not accomplished, recourse may be had to operation.

Following reduction, a plaster-of-paris bandage is used as a retentive apparatus. Care should be taken to over-correct the potential deformity by maintaining the knee in the over-corrected position. Weight-bearing may be started early without fear of depressing the fracture fragments.

In the average case the leg is immobilized for four to six weeks. If the joint is arthritic, the immobilization period may be cut short. After the sixth week, motion is started. Massage and gentle passive motion are used to improve the musculature, and swimming is an excellent form of exercise at this time. Some type of protective caliper may be worn for several weeks to limit the weight-bearing.

Böhler[93] has a very clever method of reducing by means of pins and pressure, first having the fracture well in mind from his radiographic study. He is careful to get under the table of the tibia and push it up, and not to depend on thrusting up the cortex to carry the whole fragment up. Reduction is followed carefully by x-ray to make sure that a large portion is not left.

In operative reduction of a fracture, the writer uses either a longitudinal lateral incision or a U-shaped incision. The method of reducing, and of maintaining the displaced fragment in position, differs according to the pathology found upon exposure of the fracture. Accordingly, these features will be discussed in connection with the individual cases. Simplicity should be the keynote. Screws, plates, and nails are used to fix the fragments in position. When, in the unicondylar type, the fragments are widely separated and it is difficult to maintain position, a bolt may be driven through the entire tibia and the fragments brought together by tightening a nut over a washer. Such a procedure, however, is rarely necessary. Klapp[94] has described a compression-extension method of drawing the fragments together by means of a wire loop loaded with weights, a method which he believes has certain advantages over the support furnished by a nail or peg. König[89] obtains such compression by the conservative method of pressure on the osteoclasts, and claims that it is possible to secure good anatomical and functional results.

Following operative reduction, the leg is immobilized in a plaster-of-paris bandage, and the same after-treatment carried out as in conservative reductions.

CASE I. Mr. D. V., aged forty-seven years.

History: This patient fell from a stepladder, landing on the right foot.

Physical Examination: Widening of the upper tibia was apparent. The fractured tuberosity was palpable. The anterior displacement was very marked. The knee had 25 degrees lateral wabble.

Treatment: Conservative reduction was decided upon. This was accomplished by forcing the fragments together with the jaws of a Thomas wrench. It will be noted that the displacement was outward and anterior as well as downward.

Result: Two months after reduction, the knee had motion in flexion of 110 degress, was stable laterally, and free from pain.

CASE II. Mr. A. R., aged fifty-seven years.

History: This patient, while stepping off a milk truck, misjudged his step and fell, landing on the left foot with such force as to cause the knee to be forced inward. Following the injury, he was unable to bear weight, and all motions caused severe pain.

Physical Examination: When seen immediately after the accident, the entire knee showed moderate

swelling. No fluid was determined. There was marked tenderness over the internal semilunar cartilage and the internal lateral ligament. There was 20 degrees knock-knee. A roentgenogram showed a depressed fracture of the external tuberosity of the tibia.

Operation: The displacement was forward, with a depressed comminuted area in the centre of the tuberosity and fissures running forward and backward. The external cartilage was found detached except anteriorly and posteriorly. This was removed. The blood-clots were removed, and the depressed area was elevated. The reposition was considered very satisfactory. There were marked arthritic changes in the knee. A plaster bandage was applied with the knee in over-correction.

Result: Convalescence was very slow. Six months after the operation, the patient had a stable knee with motion to a 60 degree angle. He had not yet returned to his work. This end-result, in view of the arthritic changes in the knee, was very good. The case illustrates the advantage of early reduction.

Comment: In this particular instance the roentgenogram did not reveal the full extent of the injury, and the comminution was not correctly estimated.

CASE III. Mr. H. V., aged fifty years.

History: While this patient was riding in the hunt, his horse slipped and came down on his haunches. The patient's right leg, fully extended, came down on the heel with full force. Pain and disability followed.

Physical Examination: The patient was seen a few hours after the accident. The upper fibula was prominent. There was an acute bow of the leg just below the knee joint, as compared with the normal leg. A roentgenogram showed a comminuted fracture of the external tuberosity of the tibia.

Treatment: The fracture was reduced by the hammer method, and a plaster bandage applied.

Result: Five months after the reduction, the knee had 70 degrees of motion. There was no instability and no pain.

CASE IV. Miss G. M., aged twenty-two years.

History: This patient sustained several injuries in an automobile accident. The fracture of the external tibial tuberosity was not noticed until several weeks after the injury.

Physical Examination: The roentgenogram taken eight months after the accident showed considerable displacement of the inner half of the outer tuberosity of the tibia, leaving the outer half in good position, thus accounting for the stability seen at this time. The knee, when fully extended, had only a few degrees wabble.

Treatment: It was considered inadvisable to attempt reduction at this late period, inasmuch as there had been considerable damage to the intercondylar eminence. Support was considered unnecessary as the patient had not walked on account of other injuries.

Comment: One year later, the knee had 5 to 8 degrees lateral instability and was painful after excessive use. The knee was considered to be about 25 per cent. permanently disabled, and it was expected that the disability would increase with use.

CASE V. Mr. F. G., aged fifty years.

History: This patient's horse fell on him, striking the knee.

Physical Examination: Twelve hours after the accident, examination showed a fragment of the tibia displaced anteriorly. It will be noted that the displacement was wide (Fig. 4).

Treatment: Reduction was accomplished by driving the fragment back into position by means of a heavy hammer. A thick pad of felt was used to protect the skin.

Result: Nine months after reduction, the knee functioned nearly normally, having 100 degrees of motion and only very slight lateral instability. The knee ached during damp weather and seemed to tire easily. Roentgenogram (Fig. 5), taken one month after treatment, shows the complete reduction.

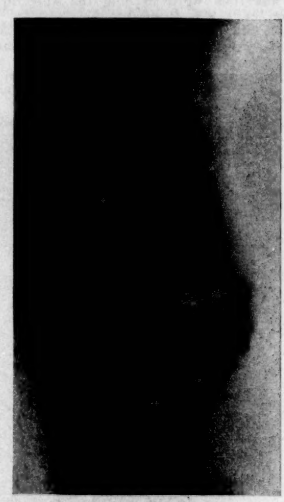

FIG. 4. Case V. F. G. Showing the wide outward displacement of the fragment of the external tuberosity.

Comment: This case illustrates well the accomplishment of reduction by conservative methods in a displacement which was outward rather than downward, and which was treated immediately following the injury.

CASE VI. Mr. F. L., aged thirty-three years.

History: This patient was injured in the right knee when an empty gas drum, on which he was working, exploded. The mechanics of the trauma could not be determined. A roentgen film showed a fracture of the external tuberosity of the tibia with some displacement of the fragment downward.

Physical Examination: When the patient was first seen, four months after the accident, the knee had already been opened. A roentgen film showed the tuberosity fracture in fair position. The problem at this time was the restoration of motion, as the joint had only about 20 degrees motion in flexion. In addition, there were 20 degrees lateral movement and marked periarticular swelling.

Treatment: In view of the atrophy, swelling, and loss of motion, it was not considered advisable to intervene again. The patient was fitted to a walking ring caliper with increasing motion.

Two months later, the knee gave way when the patient was walking. There seemed to be displacement over the anterior part of the tuberosity, and the tenderness over the head of the tibia persisted. There was motion in flexion to 85 degrees. When the joint was at rest, there was about 3 to 5 degrees knock-knee; by forcing, this could be increased to 20 degrees.

Operation: Upon open intervention the fragment of the condyle was found to be partly absorbed and held down by dense scar tissues. Severe joint changes were present. The external cartilage was indistinguishable. An attempt was made to free and lift up the outer condyle and to hold the fragment in place by a wedge of bone. The knee was immobilized in plaster for five weeks. A walking caliper was then worn to hold the knee in overcorrection.

Result: Six months after the operation the patient had 90 degrees motion. The joint was still

FIG. 5. Case V. F. G. Showing the excellent reduction obtained by the hammer method.

weak and unstable, although there was only 5 degrees wabble at the knee.

Comment: This patient was not seen for treatment until four months after the injury. Only a fair reduction could be accomplished, and only a fair end-result could be expected.

CASE VII. Mr. M. C., aged seventy-one years.

History: This patient was in an automobile accident, sustaining a simple fracture of the right fibula and a fracture of the external condyle of the right tibia.

Physical Examination: We saw the patient six weeks after the accident. The fractured fragment of the tuberosity was displaced very slightly and allowed about a 5 to 8 degree wabble.

Treatment: In view of the age and general condition of the patient, operative interference was out of the question. A walking leather caliper was made from a plaster model taken with the knee in as much over-correction as possible. This gave excellent support. The patient has motion of 80 degrees in flexion. There is 15 degrees knock-knee when the knee is in 10 degrees flexion. The knee cannot stand excessive weight-bearing, but there is no catching or locking. A caliper will be necessary permanently.

CASE VIII. Mr. G. C., aged fifty-five years.

History: While this patient was untying a cow, the rope became twisted around his leg and he fell to the ground.

Physical Examination: The patient was seen shortly after the injury. He was unable to walk. The right knee was swollen, the leg and foot rotated inward, and foot-drop was present. There was crepitus in the knee and the entire joint region was tender. A roentgenogram showed a vertical fracture through the outer half of the head of the tibia, with marked outward tilting of the fragment.

Treatment: A manipulation under ether was done, and as much genu varum as possible obtained.

Result: It was impossible to locate this patient to ascertain the result. Examination when the leg was in the plaster bandage had showed the fragment in good position and the joint in good alignment.

CASE IX. Mrs. H. B., aged fifty years.

History: This patient was struck on the outer side of the left knee by the bumper of an automobile as it was being backed out of a garage. She suffered a great deal of pain upon recovering consciousness. There was considerable swelling in the knee. The joint was treated conservatively by means of sandbags and weights, plaster bandages, and baking and massage. The pain persisted upon any motion, and the knee was becoming stiff.

Physical Examination: We saw the patient for the first time eight months after the accident. She walked with a crutch. The left knee was in 40 degrees permanent flexion. It had about 30 degrees lateral motion, and was painful. There were marked periarticular thickening and some joint changes. A roentgenogram showed a fracture of the external tuberosity of the tibia. The fragment was displaced downward and outward, forcing the fibula outward, so that the tibial table extended beyond the femur for a distance of about three-quarters of an inch.

Treatment: The disability was so great and the statics of the knee so greatly disturbed that open operation was decided upon, although we realized that the convalescence would be long and that the general joint damage was permanent.

Operation: The fragment was pried up with difficulty, and the knock-knee deformity over-corrected by a snug plaster. The external meniscus was found loose, and removed.

Result: Two years after the operation, the patient had only 20 degrees motion in flexion. This was increased by a manipulation under ether. The knee had excellent stability and was painless. Some tenderness persisted. The end-result was only fair, although a good reduction had been obtained, and the knee carefully protected from the time of operation.

CASE X. Mrs. C. B., aged fifty years.

History: This patient was hit by an automobile.

Physical Examination: When the patient was first seen at our clinic, a roentgenogram showed an old fracture of the external tuberosity of the right tibia. Open reduction had been done, and apposition obtained with dipping down of the inner part of the fractured fragment, which allowed the knee to wabble. Replacement of the fragment by the open method was advised, although the prognosis was not encouraging.

Operation: The fractured fragment was exposed through a lateral incision, and then freed through a circular incision below the point of exit of the fracture, care being taken to preserve the attachment of the fragment to the lateral ligament. The fragment was pried up into place and fixed with a bone screw.

Result: About five months after the operation, the knee had 85 degrees motion in flexion. When the leg was straight, there was less than a 5 degree wabble, but at 45 degrees there was a 10 degree

wabble. A roentgen film showed complete union with the peg in position. The joint surfaces were slightly irregular in outline.

CASE XI. Mrs. B. R., aged thirty-five years.

History: This patient, as she was walking from behind a trolley car, was struck by an automobile going at a rapid rate. She was picked up on the bumper of the car and carried about 100 feet.

Physical Examination: The patient was first seen six months after the accident. She was unable to walk without crutches. A roentgenogram showed the external tuberosity of the left leg fractured, and both tuberosities of the right leg broken (Fig. 6). On the left side there was about 65 degrees motion in flexion, swelling, soreness, and there was no cartilage thrust. On the right side there was flexion to a right angle, little lateral instability, and the cartilage-thrust could be felt.

Treatment: Conservative treatment was advised. Baking and massage were begun. It was our opinion that the left knee would slowly become a satisfactory joint. A leather leglet was worn on the right leg.

Result: Two years later, the patient walked without a limp. The left knee was a more satisfactory joint than the right. On the right side there was a 10 degree knock-knee, and a 5 degree wabble with the knee extended. There was considerable crepitation. On the left side there was less than 3 degrees of wabble. There was no swelling or heat on either side.

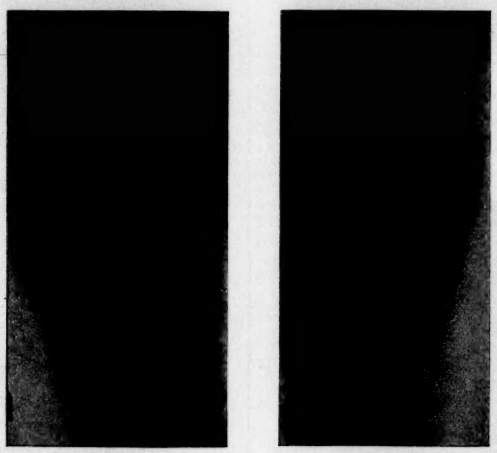

FIG. 6. Case XI. B. R. Showing fracture of both the inner and outer tuberosities on the right side and fracture of the external tuberosity on the left side.

CASE XII. Mr. O. P., aged forty-nine years.

History: The patient fell from a box, sustaining a fracture of both the tibia and the fibula.

Physical Examination: He was seen on the day following the accident. A roentgenogram showed the tibia to be fractured just below the tuberosity; the fracture was transverse and oblique, and it extended up through the external condyle (Fig. 7). There was a definite depressed central area on the external tuberosity.

Treatment: Under ether, an attempt was made to reduce the fragment, which was found loose and could be corrected to some extent.

One month later, it was considered advisable to attempt a better reduction, and the hammer method was used. Following this second reduction, considerable lateral displacement was determined both clinically and from the roentgen films. The patient refused open reduction.

Result: Two years after the second reduction, the knee was in splendid condition. There was no wabble, heat, nor swelling. A bony prominence was felt over the old fracture (Fig. 8).

Comment: This end-result seems to add weight to the contention that external tuberosity fractures with lateral displacement are less disabling than internal fractures with much less displacement.

CASE XIII. Mrs. L. M., aged eighty-two years.

History: This patient injured the right leg in a fall one year ago. At the time, the leg was up in a support for six weeks, but no attempt was made to reduce the fracture of the tuberosity. Since then the patient had much trouble owing to deformity.

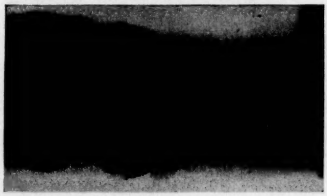

FIG. 7. Case XII. O. P. Showing fracture through the external tuberosity with depressed central area.

Physical Examination: When we first saw the patient, one year after the accident, there was 30 degrees knock-knee and much infiltration. The knee was in 5 degrees flexion deformity.

Treatment: The patient was not considered a

suitable risk for operation. A walking caliper with a knock-knee cap was advised. The patient gets about nicely with the brace.

CASE XIV. Mr. J. V., aged fifty years.

History: This patient, following a fall from a stepladder, had severe pain in the region of the left knee and was unable to walk.

FIG. 8. Case XII. O. P. Showing knee joint after two years.

Physical Examination: Examination showed an extensive comminuted fracture of the upper end of the tibia and fibula, extending into the knee-joint (Fig. 9).

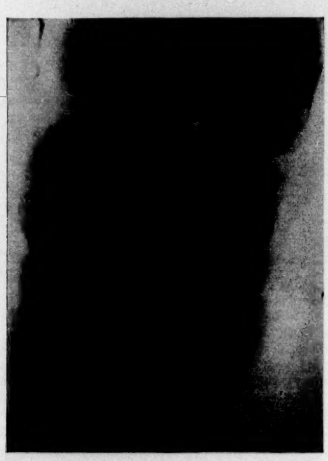

FIG. 9. Case XIV. J. V. Showing an extensive comminuted fracture extending through both tuberosities and upper tibia.

Treatment: The fracture was reduced by closed reduction.

Result: Four years after the reduction, the patient wrote to us that his knee approaches normal in every way. He can do everything with it, and it is stable and strong (Fig. 10).

CASE XV. Mrs. F. S., aged fifty years.

History: This patient was knocked down by another person and fallen upon.

Radiographic examination showed a fracture of the external tuberosity with a large fragment pushed outward and the inner part of the tuberosity crushed down (Fig. 11).

Operation: The fracture was exposed through a curved incision. The external cartilage, which was found torn, was removed. The fragment was pried up into position, and two bone screws were used to fix it in position (Fig. 12).

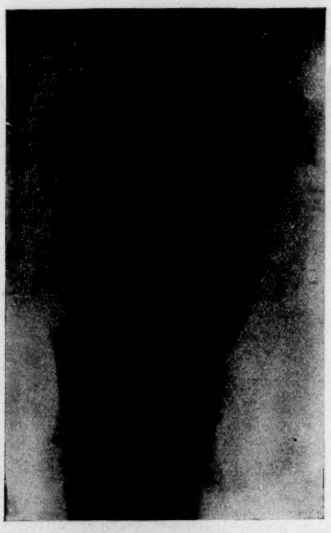

FIG. 10. Case XIV. J. V. Showing the end-result obtained from closed reduction.

FIG. 11. Case XV. F. S. Showing fracture of the external tuberosity, with the large fragment pushed outward, and the weight-bearing surface depressed.

Result: Ten months after reduction, the result was excellent. The knee went into full extension and had 80 degrees motion. There was no swelling

or tenderness. A roentgenogram showed good alignment.

CASE XVI. Mrs. M. S., aged forty years.

This was a case of fracture of the inner tuberosity of the tibia, but unfortunately I am unable to find the complete record.

CASE XVII. Mr. J. D., aged fifty-two years.

History: This patient was struck on the back of the neck with a bag of cement. The blow caused him to fall and he fractured the external tuberosity of the tibia and the hip.

Physical Examination: We first saw the patient about a year after the accident. He stood with about a 5 degree knock-knee. When the knee was fully extended it had about a 5 to 8 degree wabble, which increased when the knee was flexed. There were marked cracking and crepitation over the external tuberosity of the tibia, suggesting a loose

FIG. 12. Case XV. F. S. Showing fixation of the fragment by two bonescrews.

fragment. A roentgenogram failed to reveal the loose body, but it did show partial absorption of the fragment and marked arthritic changes throughout the knee-joint.

Treatment: This patient was seen very recently. He was fitted to an elastic knee cap, and is to report in two weeks. His insurance company urged him to return to work as a longshoreman. Meantime, we shall keep the patient under observation and watch the effect of use, with his present deformity and arthritic complications.

CASE XVIII. Mr. T. C., aged fifty years.

History: Four months ago, when the patient was removing a plank from a railroad truck, a train struck the plank, and the plank in turn hit the worker on the outside of the right knee. The knee gave away when weight-bearing was attempted.

Physical Examination: The knee was unstable, having about 8 to 10 degrees lateral mobility when the joint was fully extended; with the knee at a right angle there was about one-half inch forward instability. There was marked tenderness over both inner and outer cartilages. The joint was filled with fluid. A roentgenogram showed a marginal fracture of the outer table of the tibia and a fracture of the anterior half of the spinous process of the tibia. The fragment apparently held the anterior crucial ligament.

Treatment: A longitudinal incision was made. The internal cartilage was explored, found to be hypermobile, and completely removed. The spine of the tibia was loose, and acted as a loose body in the joint, being pulled back and forth by the crucial ligament. The loose fragment was removed.

Two weeks following operation, a plaster bandage was applied from the toes to the groin, and weight-bearing was started. The patient is to wear this bandage for six to eight weeks. This time has not yet elapsed. We hope that some of the lateral instability will be taken care of. It is expected that the knee will have a permanent 75 per cent. disability.

CASE XIX. Mrs. G. B., aged fifty-seven years.

History: Two hours before we saw the patient, she had fallen off a piazza and struck her right knee.

Examination: A roentgenogram showed a simple fracture of the external tuberosity of the tibia, with slight displacement downward and outward.

Treatment: Under an anesthetic, the lateral fragment was pressed inward, and a plaster-of-paris shell applied to maintain the leg in slight varus.

Result: Three months following reduction, the patient was walking well with a cane and doing a great deal of housework. There was no pain or tenderness. The fractured area measured three-eighths of an inch larger than the other leg.

CASE XX. Mrs. G. W., aged fifty-eight years.

History: The patient was thrown out of an automobile, and sustained an injury to the knee.

Physical Examination: Two days after the accident, the knee was sore, there was increased knock-knee, some lateral mobility, and some fluid in the joint. A roentgenogram showed a comminuted fracture running into the outer tuberosity of the tibia, with the fragment displaced outward from three-eighths to an inch.

Treatment: A mallet was used to hammer the fragment into place, and a plaster dressing applied.

Result: Two years and six months after the reduction, the knee was perfectly normal. The patient was able to do anything, and came into my office after walking three miles. This was the best result obtained in any of these cases.

CONCLUSIONS

From the study of the literature and the above series of fractures involving the tuberosities of the tibia, the following conclusions are drawn:

1. Immediate recognition and treatment are most essential.
2. A most careful study of stereoscopic x-ray films should be made before attempting treatment.
3. The best possible reposition of fragments, especially in fractures involving the inner tuberosities, should be obtained.
4. Closed reduction in this series of fractures has given excellent results.
5. Fractures of the inner tuberosity are much more uncommon than the literature would lead one to believe.

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DEATHS FROM ACUTE POISONING

An analysis of 440 deaths from acute poisoning among Metropolitan Industrial policyholders discloses that more than one-quarter (115) resulted either from the mistaking of poisonous drugs for medicines or from overdoses of medicines containing poisons. Among the actual poisons which caused these 115 deaths bichloride of mercury leads the list with 22; overdoses of either allonal, luminal or veronal proved fatal in 18 instances; arsenic caused 12 deaths, lysol, 11 and carbolic acid, 6. In 28 cases, various other poisons were named and in 6 the name of the poisonous substance was not specified.

Ingestion of wood or denatured alcohol, taken either as a substitute for alcoholic beverages or mistaken for alcoholic beverages, caused 118 deaths, or more than one-quarter of the cases studied.

Young children are more frequent victims of accidental poisoning than are persons at any other age. There were, for example, 104 deaths of young children in this group of cases, in most of which the death resulted from the carelessness of parents in leaving pills or other poisonous agents within reach. Strychnin takes a heavier toll of child life than does any other poison, with kerosene, lye, oil of wintergreen, arsenic, and phosphorus figuring more or less prominently. Based on the results of this study, we would stress the dangers which arise from leaving poisons within the reach of young children. While most of these deaths were probably due to sheer carelessness on the part of parents, it is possible that, in many cases, the parents did not know that they were actually leaving deadly poisons where children would have access to them. More conspicuous labels on containers would thus have averted some of these deaths.—*Metropolitan Life Insurance Company Bulletin.*

RIGHT USE OF CHILDREN'S INSTITUTIONS

The chief function of a children's institution should be as a receiving home and training center to give temporary intensified care during an emergency in a child's life, but it should not be primarily a vocational school. This conclusion was reached at the round-table discussion of the Eastern Regional Conference of the Child Welfare League of America, recently held in Baltimore. During the period of care, the Conference advised, every effort should be made to preserve the child's individuality and his family and community contacts. A child dependent because of poverty uncomplicated by the death or the physical, mental or moral incapacity of parents or guardians, should never be sent to an institution but should receive public or private assistance so that he may remain in his own home.—*U. S. Children's Bureau, Washington, D. C.*

NEW ENGLAND HEART ASSOCIATION

AUSCULTATION AND HEART SOUNDS*

BY HOWARD B. SPRAGUE, M.D.†

Heart Sounds

HISTORY

THE knowledge that the beating of the heart produces sound is of unknown antiquity but attracted its first public notice when it was described by Harvey. Laennec continued these observations from a clinical viewpoint and noted the double character of the sound, but adopted the incorrect interpretation that the two sounds represented the vibrations of ventricular and auricular systole. Turner, in 1829, discovered that the second sound was at the beginning and not at the end of diastole. Slowly evidence of the cause of the sounds accumulated during the rest of the 19th century through the work of Skoda, Williams, Ludwig and Dogiel and others, until in 1894 Einthoven and Geluk analyzed their nature with the capillary electrometer. In 1893 Barié first heard the third heart sound, which was brought to clinical attention by Thayer in 1908.

NORMAL HEART SOUNDS

There are three normal heart sounds to be studied in the practical interpretation of cardiac activity, although examination by more refined methods than stethoscopy has shown other constant, but usually inaudible vibrations. These sounds are heard best at points on the chest wall which, though at times relatively remote from the cardiac structures producing the sound, are the points of optimal contact between heart and chest wall.

First Sound

The first heart sound is heard best in most cases at or near the maximal apex beat. In patients with the "drop" or "ptotic" type of heart it may be heard better in the region of the xiphoid. The note is deeper and more prolonged than the second sound and is produced by the friction of the contracting cardiac muscle fibres and the closure of the mitral and tricuspid valves. Other explanations have been proposed but are as yet hypothetical.

Second Sound

The second heart sound is heard most intensely at the base of the heart in the second intercostal spaces to the right and left of the sternum. It is produced by vibrations set up in the semilunar valves at the time of their closure by the rebound against them of the blood columns of the distended aorta and pulmonary artery at the cessation of ventricular systole. The sound is higher pitched than the first sound, and shorter because of the damping effect of the blood in the great vessels.

Third Sound

A third heart sound is a normal finding in a large number of children and young adults and can be heard practically universally in such persons on listening to their hearts when they are in the recumbent (especially left lateral) position after exercise. It is best heard at the cardiac apex or slightly above or mesial to it. Normally it is said to be about 1/200 as loud as the second sound. It is dull and thudding in character, sounding like a muffled echo of the second sound in the middle of diastole. Its cause is unknown, but it is related to the opening of the mitral valve and the beginning of blood flow from auricle to ventricle.

ABNORMALITIES OF THE HEART SOUNDS

The normal sounds of the heart vary tremendously in their various characteristics in different individuals, as will be later described, but often undergo modification from pathological influences. Such changes are mainly in intensity, but may be in pitch or quality and by the introduction of elements producing reduplication and aberrant accentuation.

Changes in Intensity and Reduplication of Sounds

1. *First heart sound*

a.—*Increase in intensity.* The main factors producing an increased intensity of the first sound are: (1) tachycardia from exercise, fever, emotion, or thyrotoxicosis; (2) hypertension; (3) early myocardial failure; (4) in rare cases, introduction of air into the circulation, when the sounds may be heard at a considerable distance from the patient; (5) in cases of complete heart block, when auricles and ventricles happen to beat synchronously; and (most important) (6) mitral stenosis.

b.—*Decrease in intensity.* Factors decreasing the intensity of the first heart sound are: (1) normal bradycardia from rest; (2) increased thickness of chest wall from muscle, fat, or mammary development; (3) interposed intrathoracic pathology, such as emphysema, pleural or pericardial fluid or air, and displacement of the heart by pneumothorax, dextrocardia or other factor; (4) the masking effect of

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cardiac murmurs; (5) myocardial failure, chiefly from coronary disease; (6) valvular deformity, interfering with proper closure of mitral or tricuspid valves.

c. *Reduplication.* The first sound may be slightly reduplicated normally in young persons and often varies with respiration. At times in older patients ventricular asynchronism or disproportion of pressure differences in the right and left sides of the heart, whether or not explained by electrocardiographic evidence of intraventricular block, may be responsible for splitting of the first sound. In rare cases delayed auriculoventricular conduction with an audible auricular sound preceding the ventricular contraction accounts for such reduplication.

2. *Second heart sound*

a.—*Increase in intensity.* The mechanism producing increased loudness of the second sounds is usually clear. In the case of raised pressure in the greater circulation the aortic second sound tends to increase in intensity and often to alter its quality from the more forceful closure of the valve at the beginning of diastole; in hypertension of the pulmonary circuit (as in mitral stenosis or emphysema) the corresponding change occurs at the pulmonary valve.

b.—*Decrease in intensity.* The second sounds are decreased in intensity by (1) low blood pressure (chiefly systemic); (2) valvulitis interfering with the closure of the aortic and pulmonary valves (chiefly stenosis); (3) early premature beats not raising or only slightly opening the semilunar valves; (4) extra- and intrathoracic factors mentioned under 1 b.

c.—*Reduplication* of the second sounds is attributable to asynchronous closure of the aortic and pulmonary valves due to relatively increased pressure in systemic or pulmonary circuits.

3. *Third heart sound*

An increase in intensity of the third heart sound is often found normally with the tachycardia of exertion, emotion, effort syndrome, thyrotoxicosis, or fever. Such an increase in the absence of these factors and in the presence of a suspicion of mitral valvulitis is frequently suggestive evidence of this disease. In advanced mitral stenosis, the third sound may become very loud, even as loud as the second sound.

4. *Other sounds*

In a considerable number of patients with complete, or high grade partial, heart block auricular sounds can be heard. These are dull and distant, occurring in the long ventricular diastoles and may be heard anywhere over the precordium but usually best at the apex, lower end of sternum, or third left interspace.

In rare cases clicks or snaps, or other abnormal sounds, may be heard on auscultation of the heart. Some are produced in lungs or pericardium, or perhaps by the vibration of anomalous chordae tendineae or other structures in the heart.

Gallop Rhythm

Gallop rhythm is a term used to describe the sounds heard in the heart when, by the introduction of a third element of sufficient intensity, a characteristic accentuation of the beat, and an optimal cardiac rate, the impression is given of the sound made by a galloping horse. The third element is usually in diastole; if in early diastole, the rhythm is called proto-diastolic; if in presystole, it is called presystolic. In youth, when the third sound is normal and may be accentuated by normal factors, such as excitement, this rhythm, in the absence of cardiac disease, is unimportant. In older people, especially those with hypertensive, coronary, or syphilitic heart disease, it is a sign of very grave portent and the lives of such patients, after it is found, is usually only a year or two at best.

Changes in Quality of Heart Sounds

The heart sounds, in addition to changes in loudness, frequently change in quality, when the heart is diseased. The first sound may become "valvular" or "snapping" and approach the second in its tone character in myocardial failure. When tachycardia also is present, a "tic-tac" beat is said to be heard and is usually a bad sign. In other cases the sound is not clear-cut and is called "weak" or "flabby". The clinical descriptions, while often subjective, are not without their value in following individual cases.

The second sounds may become "ringing" or "snapping" with increased tension in one or the other circuit as well as increased in intensity. Such a change in the aortic second sound is thought by some to be useful in suspecting early aortitis.

Auscultation

The purpose of auscultation is to transmit the complex sounds produced by cardiac action from the heart of the patient to the brain of the observer, usually by the use of a stethoscope. These sounds are not simple notes but are noises or complex vibration forms, varying in intensity, pitch and quality. The heart sounds themselves usually fall in a frequency period of 16 to 400 cycles per second. There is a wide normal range in loudness; Williams and Dodge noted a ratio of 40:1 in 20 unselected normal adult males in the energy produced by the first heart sound.

The sound produced at the heart finds a path of least resistance to the surface of the chest in relation to the resonating and damping qualities of the body structures through which it passes and arrives at optimal auscultation areas often quite distant from the points on the chest wall nearest anatomically to the parts of the heart producing the sound.

The chief variable factors complicating auscultation are:

(1) Differences in the heart sounds at their point of production.

(2) Intrathoracic and extrathoracic conditions (such as fluid in the pericardial cavity or thickness of the chest wall), altering the sounds by reflection, refraction, resonance, and damping of the sounds as they pass from one medium to another.

(3) The light or heavy pressure of the stethoscope on the chest.

(4) The type of stethoscope chest-piece (the diaphragm or Bowles being better for high-pitched and the bell for low-pitched notes).

(5) The peculiarities of human audition which make the normal ear relatively insensitive to low-pitched sounds.

(6) The special training of the observer.

(7) The variability of auditory and cerebral acuity in different individuals.

In practical auscultation, therefore, it is important for each physician to develop his own normal criteria for heart sounds, to examine the patient in different positions and phases of respiration, and with stethoscopes having tone characteristic sufficiently variable to cover the range of sounds of clinical significance.

HEART MURMURS IN THE PRACTICE OF MEDICINE*

BY WILLIAM D. REID, M.D.†

HEART murmurs are classified as systolic, presystolic, and diastolic.

Systolic murmurs are notoriously unreliable evidence of organic disease of the heart. Examination of university students discloses that about 20 per cent. of those classified as normal have a systolic murmur. Neither the British nor our own army in the World War considered the presence of a systolic murmur, in the absence of other abnormal findings, ground for exempting men from military service. Some observers believe that at times they can determine that systolic murmurs of a certain quality indicate disease of the heart, but, in my opinion, it seems sound to doubt our ability to make such a differentiation. The necropsy findings too often fail to confirm diagnoses so made. It seems wiser to demand evidence other than that of the systolic murmur.

True *presystolic murmurs* are not very common. It is notable that the presystolic murmur has lost some of its importance in recent years. Formerly it was considered pathognomonic of mitral stenosis; today it is known that this murmur is not constantly present in mitral stenosis and, when detected, it does not always indicate this valvular lesion.

Diastolic murmurs, with but rare exceptions, indicate disease of the heart. They are, therefore, important findings in cardiac auscultation; consequently, the remarks to follow will be limited mainly to diastolic murmurs.

DETECTION

A survey of the various means of detection of murmurs and their relative value will be presented.

The stethoscope is of value. Two chest- or end-pieces are needed. The diaphragm type, such as is part of the Bowles stethoscope, is often essential for the detection of the diastolic murmur of aortic regurgitation, and occasionally the low-pitched middiastolic murmur is heard only when using some sort of bell chest piece.

Position of patient. There are certain positions of the patient, as emphasized by Pardee, that are of assistance in the detection of cardiac murmurs. Thus, leaning forward, blowing out the breath and ceasing to breath at that phase, aids in the detection of the aortic diastolic murmur; that of mitral stenosis is often best heard when the patient lies on the back and is slightly turned to the left.

The *point of maximum audibility* of the murmur is still considered to be important. Mitral diastolics may be audible over but a small area at, near to, or especially just outside the cardiac apex. The left sternal margin is the locus of maximal audibility of the diastolics of aortic origin.

Transmission. This feature is of limited significance. It offers little, if any, aid in the differentiation of murmurs of functional, from those of organic, causation. One who believes the transmission of a systolic murmur to the axilla or left back is reliable proof that the murmur is organic is unaware of the evidence, checked by necropsy, presented against this fallacy by Graham Steell as long ago as 1895. Such transmission is, of course, some evidence of the loudness of the murmur, if that is of any comfort.

The *timing of the murmur* is of importance. The best method is that of palpating an impulse as one auscults the precordia. The apex impulse is usually reliable, that of the carotid artery is most trustworthy, while that of the radial pulse is unreliable in difficult cases with an accelerated rate of the heart, since the beat is delayed 1/10 second in transmission to the radial artery.

The time that the murmur begins should re-

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ceive attention and is too often neglected. The aortic diastolic begins with, and commonly continues after, the second sound, whereas the mitral begins immediately subsequent to the second sound. This is in accord with the events of the cardiac cycle. Of course, in cases in which the second sound is not audible at the apex, this aid is not available.

Exercise. Having the patient perform some exercise and then ausculting immediately afterward is rarely of assistance, in my experience. Occasionally exercise that accelerates a previously slow rate to one of approximately 100 per minute is helpful, but if the rate quickens to 120 or higher, it is often difficult to detect the murmurs.

Amyl nitrite. Auscultation after the patient has inhaled the fumes of amyl nitrite gives about the same results as the use of some exercise and for this reason I no longer use it.

It is worthy of emphasis that the aortic diastolic murmur may be present with the aortic second sound or the latter may be masked.

GENERAL COMMENT

The differentiation of organic and functional murmurs is not successfully made by auscultation. It is best made by consideration of all the data,—history and physical examination, especially findings other than the detection of a systolic murmur.

Murmurs are but one feature of cardiac examination. The condition of the heart muscle, as stressed by the last Sir James Mackenzie, is often of more importance. What degree of symptoms, if any, of cardiac insufficiency is present? The presence of congestive failure, or if you prefer, "broken compensation" determines which patient is ill and which one may be able to live an essentially normal life.

One heartily agrees with Mackenzie on the importance of the condition of the myocardium, but today would emphasize a point in which he did not believe. It is that the physician should strive to determine what is the probable etiology of the cardiac disease. Recognition of whether syphilis, the rheumatic type of infection, the streptococcus viridans, arterial hypertension, hyperthyroidism, etc., is at work on the heart may be of decided significance in prognosis and treatment, and especially in the prevention of such disease in other patients.

SUMMARY

Pay greater attention to diastolic murmurs. The point of maximal audibility and the time in the cardiac cycle at which the murmur begins are of greatest importance. Determination of the time of onset of the murmur is too often neglected.

Know the methods of accurately timing cardiac murmurs.

Don't rely upon auscultation to differentiate functional from organic murmurs.

An estimate of the efficiency of the myocardium and determination of the etiology of the cardiac disease are usually of more importance than the mere detection of the murmur or murmurs.

HEART MURMURS AND INSURANCE*

BY FRANCIS H. MC CRUDDEN, M.D.†

AN important medical problem of the life insurance company is that of estimating the probable life duration of the people it insures. It cannot, of course, estimate the probable life duration of a single individual; but it can gauge with considerable accuracy the mortality rate of a group of people. Until comparatively recently the insurance company recognized two groups, the healthy and the unhealthy or diseased. It insured the healthy and rejected the unhealthy. The problem, therefore, appeared to be a clinical one, that of distinguishing healthy people from those with disease.

When, however, it tried to distinguish these two groups and asked the clinician, "What constitutes disease?" and "How do you recognize disease?" difficulties arose. Is overweight a disease? Does albuminuria or glycosuria in an otherwise healthy individual mean disease? If not, under what circumstances do these conditions mean disease? Even the advance of medical science did not serve to answer these questions. New discoveries disclosed such conditions as orthostatic albuminuria, and renal and emotional glycosuria—new groups which could not be definitely labeled either diseased or healthy —and so actually complicated matters.

The modern life insurance medical director does not ask, "What constitutes disease?" That is an academic question of definition. Or, "How do you recognize disease?" That is a question of clinical medicine. He inquires, "What conditions influence mortality?" That is a question of fact. It is not a question of clinical medicine. It is a question of life insurance medicine.

The material under investigation by the life insurance company is actually different from that studied by the clinician. The insurance company is interested in groups and thinks in terms of the group. The clinician is interested in individuals and thinks and talks in terms

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of the individual. The group and the individual are different entities with entirely different properties. The life duration or mortality of the group and the life duration of the individual are two entirely dissimilar and incomparable things. The life insurance company must be able to estimate the mortality of the group. It is not possible to predict the life duration of an individual.

* * * * * *

It is only comparatively recently that the life insurance company realized that the questions it asked were not clinical questions, and that the material it dealt with was not clinical material; and that, therefore, the clinician could not solve its problems. The insurance company records certain facts regarding the family history, personal history, and findings on physical examination of large numbers of people and it follows these people until they die. The insurance company, itself, therefore, ought to be in a position to determine to what extent various characteristics in the family history, personal history, and physical examination influence longevity. The development of the special methods of investigation for the solution of its own peculiar problems is a modern innovation.

What is this mortality? How can it be determined?

Mortality is a ratio. It is computed by dividing the number of deaths in any group by the number of deaths over the same period of time in the standard group. The two groups must, of course, be of the same size and of like composition as to age distribution.

The data for the computation are obtained by experience. Suppose we are interested in the influence of some impairment, say short-lived family history, or personal history of renal colic, or overweight, or heart murmurs on examination; this group will include individuals of all ages whose life insurance policies have been in force varying lengths of time. The data can be drawn up in the form of a table showing the number of individuals at each age and duration and the number of deaths. The general experience of the company will show the number of deaths to be expected at each age and duration among the same number of standard lives. Dividing the actual number of deaths in the special group by the expected number of deaths in the standard group gives the mortality ratio of the special group.

The results so obtained by investigating one sample of a group will obtain in another sample of the same group and may, therefore, be used for the purposes of prediction. Take, for example, the group of individuals with a history of renal colic. An investigation by one company showed a mortality of 99 per cent. as compared with the American Experience Table. An investigation of entirely different material by another company showed a mortality of 116 per cent. Two different investigations of still other material by a third company showed 99.8 per cent. and 100.2 per cent., respectively[1].

The discovery of this method of procedure made it possible to study the influence of any sign or symptom, any special feature in the personal, or family history, or any other characteristic, such as race, occupation or habitat. The new technique laid the foundation of life insurance medical science as a branch of medicine with methods and objectives of its own. The results have led to certain important differences in the point of view of the insurance Medical Director and that of the clinician.

Investigation has shown that people do not need to be diseased to be poor risks. As an interesting illustration of the difference in point of view of clinical medicine and life insurance medicine on this point, take the case of people who have successfully recovered from an operation for gastric ulcer. Some years ago, a clinical investigation of the subsequent history of a group of 521 such people from one of the most prominent American clinics showed that only 88 (excluding operative deaths), that is, 17 per cent., had died in 3½ years. That looks good but does not tell us much regarding the mortality from the insurance standpoint. An actuarial investigation of the same material showed that in an equally large group of the general population, with similar distribution as to age and sex, there would have been only 32 deaths in the same length of time. The mortality of the group operated on was, therefore, over 270 per cent. of the expected[2]. Similarly, overweight, functional heart murmurs, emotional or renal glycosuria and orthostatic albuminuria may not necessarily mean disease; individuals with a past history of renal or biliary colic may appear to be in good health at the time of examination; but any of these characteristics may influence mortality.

* * * * * *

The difference between clinical medicine and life insurance medicine is illustrated in the interpretation of the systolic heart murmur. The clinician asks, "What is a functional murmur? What and when is mitral regurgitation? How do you recognize these conditions?" Is there any one of these questions that every one in this room, not to mention all the life insurance examiners in the country, would answer alike? Would anyone in this room have answered these questions consistently the same over the past twenty years? The life insurance Medical Director does not ask these questions; he asks: "How does a systolic murmur influence mortality?"

Investigations of the mortality of people with so-called mitral regurgitation have been reported by three different life insurance companies. The three investigations used entirely different material; they covered different periods of time;

they were conducted independently in every respect. As these examinations were spread over a long period of time, we can probably interpret the diagnosis as meaning a systolic murmur of some kind.

The table shows the mortality ratios, in percentage of the same company's general business in each case, for three types of people: (1) those with mitral regurgitation alone, (2) those with mitral regurgitation together with moderate hypertrophy, and (3) those with mitral regurgitation and a history of rheumatic fever. One of the investigations covered, in addition, the mortality of the group with what was called a functional murmur and found it to be 114 per cent. of the company's general business.

TABLE SHOWING THE INFLUENCE OF A SYSTOLIC MURMUR ON MORTALITY

	Investigation No. 1[1]		Investigation No. 2[4]	Investigation No. 3[5]
	Mortality in percentage of the standard			
Mitral regurgitation alone	165		166	151
Mitral regurgitation with moderate hypertrophy	211 to 255		209	184
	without hypertrophy	with hypertrophy		
Mitral regurgitation with a history of rheumatic fever	299	455	209	391

Two of the companies investigated the causes of death in these groups. In the group with mitral regurgitation alone, one of them found ten times as many deaths from heart disease as in their general business; in the group with mitral regurgitation and hypertrophy, more than ten times as many deaths from heart disease; and in the group with mitral regurgitation and a history of rheumatic fever, over thirty times the expected (nearly 70 per cent. of the total deaths). The second company reported in the group with mitral regurgitation alone seven times as many deaths from circulatory disease as in their general business; in the group with mitral regurgitation and hypertrophy more than six times the expected number of circulatory deaths; and in the group with mitral regurgitation and a history of rheumatic fever, ten times the expected number from the same cause. The company that investigated functional murmurs found four times the expected number of deaths from heart disease.

* * * * * *

What conclusions have been reached regarding the significance of the systolic heart murmur?

The clinician says that it may not mean organic mitral regurgitation. He says that we cannot recognize this condition, and that no one ever dies of it. The best available clinical evidence at present would seem to justify these opinions. But they are opinions, not facts.

The life insurance medical director finds a decreased life expectancy and an increased probability of death from diseases of the heart and vessels in those with a systolic heart murmur. These findings are not opinions, but facts.

What shall be our verdict regarding the significance of the systolic murmur as a sign of impairment: Innocent or Guilty? The facts indicate conclusively that we cannot, at present, consider any type of heart murmur innocent.

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THE NORMAL ARTERIAL BLOOD PRESSURE AND ITS MEASUREMENT*

BY SOMA WEISS, M.D.†

NOTWITHSTANDING the widespread study of the morbid states of the cardiovascular system only two aspects of the circulation, the cardiac rate and the arterial blood pressure, are measured quantitatively in the daily practice of medicine. Proper interpretation of these functions is of considerable aid in evaluating the functional state of the cardiovascular system. A lack of proper understanding of the behavior of the cardiac rate and blood pressure in normal individuals still handicaps physicians in using these measurements to interpret the functions in health and disease.

The way to modern methods for measuring the

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arterial blood pressure in man was paved mainly by the efforts of the physiologists, Vierrodt, C. Ludwig, Marey and of the clinicians, Bright, Mahomed, v. Bosch and Riva-Rocci. The apparatus proposed by Riva-Rocci in 1896 was the first to fulfill the theoretical requirements, and is in its essentials the instrument of today. This method of measuring the blood pressure is indirect; and the results are somewhat influenced by the quality of the arterial wall and the soft tissues around the artery. Nevertheless, the apparatus is exact enough for its purpose. The auscultatory method is used uniformly today. This procedure allows the simultaneous measurement of the systolic and diastolic arterial blood pressures, which should always be recorded together.

To measure the arterial blood pressure, the cuff of the instrument is placed around the arm at about the level of the heart. The pressure within the cuff is raised above the expected systolic pressure—that is, until the arterial pulsation is obliterated completely. The pressure is decreased, then, slowly. The pressure at the appearance of the first sound heard over the brachial artery corresponds to the systolic pressure. The diastolic pressure coincides with the change of the subsequent loud sounds to muffled, fainter sounds. This transition, called the "fourth phase of sounds", is not always clear. In about 10 to 15 per cent of the instances a sharp definition of the diastolic pressure is difficult. Instruments with a mercury manometer are preferable. If "aneroid" apparatus is used, this should be checked at frequent intervals against a mercury manometer. Recently more complicated apparatus have been devised for graphic registration of the arterial blood pressure in man. These instruments are certainly no more accurate than the simpler ones. The reading of the diastolic pressure often offers difficulty. The advantages of these instruments is that the personal factor is eliminated and thus an objective, permanent record may be obtained.

An appreciable variation in the systolic and diastolic blood pressures exists in normal individuals even when the blood pressure is measured under standard conditions, with the body horizontal or semirecumbent after a rest of about ten to fifteen minutes with mental excitement excluded. Extensive statistical data obtained from the examination of presumably healthy individuals for life insurance give an average level of systolic pressure of 119 mm. to 139 mm. of Hg. from the age of 15 to 66 years. At birth the arterial systolic blood pressure may vary from 20 to 60 mm. Hg. with an average of 40 mm. This pressure rises rapidly up to 80 mm. of Hg. at the end of the first month. From then on the rise is slow, reaching 100 mm. of Hg. at the age of 12 years.

The average diastolic blood pressure cannot be stated with similar exactness. This is partly due to the various phases of sounds used as an index of the diastolic pressure. The average normal diastolic blood pressures reported in the literature are often slightly high. The average variations lie between about 70 and 90 mm. Hg. between the ages 15 to 70 years. The difference between the "normal" and "abnormal" level is not sharp. The levels of 150 and 90 mm. of Hg. are accepted rather arbitrarily as the upper limits of the normal systolic and diastolic pressures respectively.

The average progressive rise in the arterial pressure observed with advancement of age is an expression of developmental and involutionary changes in the human body. It should be remembered that even within the normal range for an age period, a higher level indicates a greater burden on the heart action. In the individual case no correlation between the height of the arterial pressure and the duration of life may exist. Nevertheless, observations on sufficiently large groups demonstrate with surprising consistency that the expectancy of life decreases progressively as the arterial pressure becomes elevated.

Aside from age, sex has some influence on the level of the arterial blood pressure. The average arterial pressure of the female is somewhat lower than that of the male. Race also influences the average "normal" level of the arterial blood pressure, the level being somewhat lower in the Chinese and East Indian races than in European and American ones. The influence of weight is such that the average arterial blood pressure of the lean group is 10 mm. lower and that of the obese group 10 mm. higher than that of the average normal group.

The arterial blood pressure, because of the numerous chemical, physical and nervous factors which may influence it, shows considerable variation under different physiological functions. The direction and degree of the average variation under these conditions is often misleading because a considerable percentage of cases may show changes in the opposite direction. Menstruation has no definite effect on blood pressure. During pregnancy the normal female shows but slight variation in the blood pressure. The average figures show but 5 mm. rise after the fifth month of gestation. Change of posture from horizontal to vertical produces no uniform change in the blood pressure; subjects with a lower pressure have a tendency, however, to an elevation of the blood pressure and those with a higher pressure to a slight fall in pressure. During physical work the arterial blood pressure rises. Mental exertion and worry may produce a significant rise in the systolic and diastolic pressure in a group of normal subjects. Prolonged fatigue has a tendency to reduce the blood pressure. During sleep, the blood pressure drops about 20 mm. of Hg.

The behavior of the arteriolar and capillary

blood pressure, which depends to a certain degree on the arterial blood pressure, is out of the scope of this discussion. Unfortunately our knowledge of the arteriolar and capillary blood pressure in normal individuals under various physiological conditions is exceedingly meager and in disease, even less. Increased knowledge in this field undoubtedly will lead to the understanding of numerous morbid manifestations of the human body obscure at present.

ABNORMAL BLOOD PRESSURE*

BY ROBERT STERLING PALMER, M.D.†

(*Abstract*)

THERE is no important entity of essential hypotension since abnormally low blood pressure is associated with some important primary cause or, if occurring alone, is usually symptomless and indicative of longevity. Abnormal blood pressure, therefore, is chiefly important when it is abnormally high, usually so considered when the systolic pressure is above 140 millimeters of mercury. This is true because heart disease is the leading cause of death and the cause of a costly proportion of disability and since thirty to forty per cent. of heart disease is associated with arteriosclerosis or hypertension. There are instances of abnormally high blood pressure so intimately associated with definite disease entities that the hypertension may be referred to as secondary. Examples are the hypertension of acute and chronic glomerulonephritis, nephritic toxemia of pregnancy, eclampsia, obstruction in the urinary tract, lead, arsenic, mercury and copper poisoning, increased intracranial pressure, possibly some cases of localized cerebrovascular sclerosis, congenital increased peripheral resistances as in coarctation of the aorta, and the paroxysmal hypertension of adrenal tumors.

Of much greater interest and importance are those cases of primary essential arterial hypertension the etiology of which is incompletely understood. The earliest, and often the only, manifestation of this disease is a variable hypertension. It may appear any time from puberty onwards but is met with increasing frequency after the age of forty-five. The chief necessities are early diagnosis and recognition of all possible etiological factors.

The fundamental physiological mechanism responsible for essential hypertension is peripheral vascular constriction. Other features of the circulatory dynamics remain the same while the arteriolar portion of the peripheral vascular bed is abnormally narrowed. The hypertension thus appears to result from the necessity of maintaining tissue nutrition through these narrowed channels. The precise causes of this constriction, again, are not entirely clear. The relation of changes in viscosity, with fluid loss and concentration of the blood in the capillaries, and of the changing hydrogen ion concentration, depending upon carbon dioxide and oxygen content, to this vasoconstriction is not fully understood but may quite likely be of importance.

The subjects of this disease display a high incidence of cardiovascular disease in their family histories. The individuals manifesting essential hypertension appear to conform in some degree to a special morphological and psychological type. The former is characterized by the florid face, large skull, long and narrow jaw, wide set eyes and thick chest. The females occasionally suggest acromegaly in the appearance of head and face. Psychologically the victims of essential hypertension are strained, intense, narrow and unaccustomed to the mental ease of life.

Factors which very likely bear a significant part in the production of essential arterial hypertension are endocrine dysfunction, obesity, and continued nervous and mental strain Possible factors of importance are special dietary errors, diminished chest volume, foci of infection, and allergy.

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TREATMENT OF HYPERTENSION*

BY JAMES P. O'HARE, M.D.†

THE intelligent treatment of any hypertensive patient starts with knowledge; knowledge of the meaning of hypertensive disease and knowledge of the patient to be treated.

What is meant by hypertensive disease? A generalized disturbance of the small blood vessels together with secondary changes in the various organs supplied by these vessels.

The second bit of knowledge required is that the blood pressure in any hypertensive patient is the result of two component parts: (1) the degree of arteriosclerosis, and (2) the degree of vasoconstriction. The treatment at present centers around the latter, plus the treatment of the damaged organs.

The first question the physician should ask

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himself is: What is the state of the arterioles? The answer lies in the condition of the retinal vessels. The second question: What is the condition of the various organs, heart, kidneys, brain, etc.? The third question: Is there any need for treating the blood pressure in the given case?

In those patients with extremely high pressure, where cerebral hemorrhage or cardiac failure threatens, an attempt should be made to reduce the pressure. In those whose pressures, though above normal are relatively low, careful judgment should be exercised. Patients with a blood pressure ranging between 150 and 170, and with symptoms or signs of cardiac weakness or pain may be harmed materially by a reduction in their pressure. In the group of patients with pressure between these relatively low levels and the extremely high levels, a careful study of the degree of strain on the heart and blood vessels is desirable. It should be remembered that cerebral hemorrhage can occur with a pressure of 170 if the small vessels are abnormally brittle.

Once the decision is made to treat the hypertension, what treatment is advised?

1. Rest, physical and mental. Of the two, the latter is the more important. In those cases in which a cerebral accident or a cardiac break threatens, complete bed rest for a week or two is worth while. In the less ill patients, plenty of rest at night and rest after meals is essential. A nap after the noon meal is often the best form of treatment.

2. Reduction of activity. This, too, should not be merely physical, but also mental. A lessening of responsibilities and causes for worry is very necessary.

3. Exercise is important in keeping up general body and cardiovascular tone. Walking is the very best of all. Golf, when played easily, is also of help. If the patient is unable to walk sufficiently, massage is in order.

4. Dietetic restriction is of value in reducing the weight of the obese patient. Small meals are indicated at all times to avoid strain on the heart and circulation. A slight restriction in protein to one gram per kilo, in salt to what is naturally in the food, and in fluids to approximately three to four pints per day is desirable.

5. Innumerable drugs have been tried. Some of these which have been used commonly, in the last few years, are the iodides, nitrites, benzyl benzoate, liver extract, gynergen, angioxyl, the sulpho-cyanates, garlic preparations, akineton, gui, watermelon-seed extract, acetyl cholin, theominal and luminal. Most of these I have found to be of very little value. The nitrites, in the form of nitro-glycerin and amyl nitrite, are useful chiefly in angina pectoris and nocturnal dyspnea. Gui, in the form of intrait de gui, has in my hands been helpful in the treatment of hypertensive headache and dizziness. Theominal has been useful in headache and cardiac pain. The best drug has seemed to be luminal, acting through its quieting effect on the nervous system. The bromides may be of value in some of the milder cases. My experience with the other drugs indicates that they are largely psychotherapeutic agents. The utmost conservatism is necessary in the interpretation of all remedies used in hypertension.

6. Other measures occasionally employed in treatment of hypertension are: bleeding, where cerebral hemorrhage or a cardiac break threatens; lumbar puncture for severe headache; a prolonged warm bath; the removal of irritating foci of infection, etc.

7. Finally, we should realize that the tactful regulation of the patient's activities, together with reassurance and encouragement, are the most important therapeutic weapons we possess. No treatment is justified which makes the patient a neurotic whose entire existence centers around his blood pressure.

POISONOUS "GINGER EXTRACT"

Waves of "Ginger" extract poisoning have been reported from the mid-west and south-western states although the dangerous qualities of some products under the name of ginger extracts have been known and repeatedly emphasized in many publications.

Investigators believe that the numbers of cases exceed many thousands.

The poison produces bilateral wrist and foot drop indicating lesions in the lower lumbar and cervical areas of the spinal cord.

The dangerous ingredient of the extract is believed by government investigators working in the National Institute of Health to be tricresyl phosphate.

There are still clinical and pathological studies needed to fully clear up the problems involved.

FALSE ECONOMY

Reports from sections of the country indicate a disposition to reduce public health appropriations in order to meet the necessity for tax reduction.

This seems to be extremely unwise, for better health is more to be desired than many civic improvements. The progress already made in the prevention and control of disease should be augmented so that the nation's health will be still more generally safeguarded.

Health activities are like other educational programs and are essential to human progress. The great difficulty consists in making the average person appreciative of the blessings conferred by the many agencies working for the betterment of the people. The principles of hygiene should be a feature of home and public school instruction far more generally than is customary, so that loyalty to the health officer will be more general.

WHAT THE PUBLIC HAS A RIGHT TO EXPECT OF CLINICS*

BY MICHAEL M. DAVIS, PH.D.†

CLINICS, organized medical services for persons not confined to bed, have brought to the medical profession and the people of the United States the opportunities and anxieties which follow any new and rapid growth. Thirty years ago there were about 100 clinics in the United States, some attached to hospitals connected with medical schools, others merely soup kitchens exuding a medical flavor, in which, after the hastiest kind of an inquiry or examination, emergency relief was given or medicines doled out to the destitute. The last census of clinics, made in 1926, showed approximately 6,000 clinics maintained by a great variety of hospitals, by organized medical groups, by charitable agencies and by governmental and voluntary public health bodies.

Last autumn, the American Medical Association presented figures showing that in 1922, 678 reporting hospitals stated that their out-patient clinics had received about 9,000,000 visits, while in 1929, 1027 hospitals reported more than 19,000,000 out-patient visits. The 1027 hospitals which reported these 19,000,000 visits in 1929 represent only about half of the hospitals which maintained out-patient services in that year, though the figure includes the larger institutions. In addition to hospital out-patient services a large number and variety of clinics are maintained independent of hospitals in many branches of public health work and medical service. The American Medical Association estimated in 1922 that 30,000,000 visits a year were made to clinics in the United States. There can be no doubt that at the present time the number exceeds 40,000,000. The number of hospital beds in the United States has grown about 15 times faster than the population in the last 50 years, but clinic service has multiplied even faster.

The growth is even more remarkable when qualitative as well as quantitative considerations are taken into account. Within the memory of living men, hospitals served few except the very poor. Now patients of all economic classes seek and receive care in hospitals on a basis of pay-as-you-go, or as it might be more truthfully described, pay-if-you-can. Clinics are following the same evolution in broadening their service from the charity level upward through the whole community. Fees which are more than nominal are asked in an increasing proportion of clinics, and a growing number connected with medical schools or established as private enterprises of physicians receive middle-class or well-to-do patients who pay the full cost of the service or more. In scope, elaboration and quality of service, clinics have advanced from the hastiest form of medical dole to centers of medical service which are beset by the vices of elaboration rather than by the dangers of superficiality. In teaching medical students the diagnosis and treatment of disease, emphasis has shifted in the best medical schools from the horizontal patient in the hospital to the vertical patient in the clinic.

This expansion of clinics quantitatively and qualitatively has brought with it two problems: first, the internal or professional problem, how they shall be made efficient in rendering medical service; second, the external or public problem, how these centers of organized medical service shall be related to the care of the sick by individual practitioners and to the needs of the general public, so as to be of maximum service to society.

Much attention has been given by physicians and administrators to the first of these problems. The second has generally fallen into an area of dispute and has taken on the flavor of a trade-union controversy among supposedly antagonistic economic interests. The time has come when the existence of clinics, the fact of their past growth, their present importance and probable future expansion, must be faced by both professional and lay groups, not as a conflict of interests, but as an engineering problem to be attacked by the joint efforts of medical and lay minds confronting the necessity of an harmonious solution.

In 1925, the Associated Out-Patient Clinic formulated standards of out-patient service which were subsequently adopted by the American Hospital Association. These standards attracted wide attention and have been influential throughout this country. They were technical standards, laying down certain fundamental conditions of efficient medical service in clinics. The time has now come for a further step, namely to formulate standards which shall be of public and not merely of technical interest. The professional standards answer the question, "*How* shall clinics be efficient, that is, worth while to the patient and to the physician?" The new standards must answer the question, "What has the public a right to expect of clinics?" These standards answer the questions "What" and "Why", rather than "How".

With this aim in view, I have jotted down eight points which seem to me worth considering as policies, standards, or guide-posts—call them what you will—defining what may rightly be expected of out-patient service by the general

*Address at the New York Academy of Medicine before the Annual Meeting of the Clinic Council, Associated Out-Patient Clinics, New York Tuberculosis and Health Association, Wednesday, December 10, 1930.

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public. Let it be recalled that through fees, taxes and philanthropy, the public pays the bills for all forms of medical care, licenses practitioners and institutions, and, as shown by the statistics previously quoted, is now utilizing clinics in an increasing degree.

WHAT HAS THE PUBLIC A RIGHT TO EXPECT OF CLINICS?

1. High standards of medical diagnosis and treatment (the methods whereby this efficiency is to be achieved are defined in the technical standards).

2. A sense of personal responsibility for each patient on the part of the physician and a sense of individual attention from the physician on the part of each patient.

3. Charity to those who need charity; cost rates to those who can pay.

4. Adequate compensation to physicians for service in clinics.

5. Opportunities for professional improvement and for compensation open to all qualified physicians.

6. Organization of specialties within the clinic, to save time, expense and confusion to physician and patient.

7. Coördination of all diagnostic findings and of all treatment procedures by one physician, who should study and understand the patient as well as the disease.

8. Adequate public information as to clinic facilities and the conditions under which clinic services can be obtained.

A discussion of these points will center upon three underlying questions: (1) Can clinics render really efficient medical service? (2) Do they compete, or compete unfairly, with individual private practice? (3) How shall their publicity be extended and controlled?

CAN CLINICS RENDER GOOD MEDICAL SERVICE?

1. For a number of years, I have devoted a good deal of time to making studies or efficiency tests of clinics. Most of these have disclosed inefficiencies which have been noted without hesitation in the hope that this knowledge of shortcomings would stimulate improvement. It is gratifying to look back and see that great improvements have been made. The recent meeting of the out-patient section of the American Hospital Association illustrates this. Ten years ago this annual discussion of out-patient work would have been mostly occupied with "dispensary abuse". This subject was mentioned at the session last autumn, but eighty per cent. of the time was spent by a group of clinicians and administrators discussing standards and methods whereby the medical service within the clinic can be made most effective for the patient. In the recent improvements in clinic service and clinics which have come about, the teaching clinics have led the way. In the best clinics, service is so organized that one physician is responsible for each patient, for pooling the findings and supervising his treatment, no matter how many specialists and technicians have been involved in the diagnosis. In the best clinics, appointment systems have made it possible to adjust the time so that the patient shall have a sufficient period with the physician to enable the doctor to do his work well and the patient to obtain results. The space, arrangement, equipment, and other material facilities of the out-patient department have been transformed. Nurses, social workers, technicians, clerks, have been added for the assistance of the physician in sometimes surprising numbers.

The tradition still remains that clinics render an impersonal and mechanical kind of service in which the patient is moved through by number instead of by name, feeling like a guinea-pig and treated like a robot. There are, indeed, numerous examples of such clinics, just as there are numerous survivals of the old-fashioned "dispensary," in dingy basement quarters, with hurried physicians and a lush allowance of prescriptions per patient. It is a fair question whether an institution dealing with large numbers of people can be so organized as to combine the efficiencies and economies of organization with the individualized relationships which are essential to satisfactory medical service. Education has faced this same problem, and the best schools are no longer treating each child as a mere unit within a class, but are individualizing children. Medicine must solve the same problem.

That the problem, though yet by no means solved, is on the way toward solution is perhaps best evidenced by the attitude of those leading medical educators who, advocating the extensive use of the out-patient clinic for the teaching of medical students, assume also the position that the best teaching is coincident with the best medical service to the patient. Such service requires knowledge of the patient's personality as well as of his disease, and a sense of mutual understanding and confidence between patient and physician. The further fact that patients who pay the cost of their service are being received in teaching clinics is the most practical sort of evidence that a quality of medical service must be offered which will be worth while to the patient for its own sake and not be judged merely by the emotional tests of charity.

In considering the relationship between clinics and private medical practice, it is important to start with a clear understanding of the inherent limitations of clinic service. By no means can clinics, however efficient and however widely extended throughout the country, cover more than a certain fraction of medical care. They are confined to ambulatory patients and can care neither for bed-patients in the hospital nor for patients who need to be seen in their own homes. Clinics may indeed develop, as not a few public health leaders advocate, so that the private

offices of physicians shall be in the building of the community hospital, thus constituting a practical form of medical center with bed and ambulatory service under one organization for all economic classes of the community. There are examples of clinics of this type in some middle western towns.

Clinic service has been, and is, chiefly in the specialties. The outstanding studies of the Academy of Medicine in New York lead to the conclusion that about 80 per cent. of the clinic service in New York is for diseases or conditions which in a large city are not cared for by the general practitioner. This fundamental limitation will remain so long as the general practitioner does not receive an opportunity to associate himself with the hospital and the clinic in a more intimate way for his own benefit. Obviously, medical service in the specialties is, as a rule, more costly per visit than care from a general practitioner. There has been an inducement on the patient's side to go to a clinic for such service and a readiness on the part of specialists to receive him there rather than to receive a large number of patients free or for greatly reduced fees in their private offices.

DO CLINICS COMPETE?

2. Do clinics compete with the specialist? Do clinics compete with the general practitioner? Do they compete unfairly?

In the first place, it should be remembered that competition is not a crime in the United States. Quite the contrary. Competition is a fundamental American tradition. But competition must be fair and it is part of the public's business through the government or otherwise to see that it is fair. This also is an accepted American principle. When is competition fair and when is it unfair?

So far as clinics compete with the individual practice of medicine, they compete fairly when

(1) their service is efficient.
(2) the physicians are adequately compensated.
(3) the public has free choice between good medical service at clinics and at private offices.

Clinics compete unfairly when

(1) they offer poor service even if masked under the brownstone front of charity.
(2) they secure from physicians free medical service which ought to be paid for.
(3) they charge rates which are lower than the full cost of the service.
(4) they unduly limit their staffs.

Actually I do not think that clinics compete appreciably with the specialist, and they would practically cease to compete with even the young specialist if these younger men were paid for their clinic service. I do not believe that the clinic competes with any general practitioner who renders modern medical service to his clients. Every disinterested physician recognizes that there are practitioners who do not measure up to this standard. This fact should be faced frankly for the sake of both the public and the profession. Competition between any agency or individual rendering good medical service and any agency or individual rendering poor medical service is wholesome and should be encouraged. Clinic staffs must be restricted to those physicians who can measure up to clinic standards.

As a matter of policy the clinic should not compete with the general practitioner. It should enlist him. The general practitioner has relatively little opportunity for work in hospitals. Only a comparatively small proportion of cases are cared for in hospitals by the general practitioners; the great bulk are treated by the surgeon and other specialists. The out-patient clinic is the place wherein the general practitioner can work in stimulating and fruitful conjunction with other physicians. The clinic can also furnish facilities of laboratories, technical aides, and consultation from which otherwise a large proportion of general practitioners, working among persons of moderate means, are excluded. The great task before clinics in this country is to work out an effective method of enlisting all qualified general practitioners as participants in clinic service. This participation must be on an economic and not on a charitable basis. Every physician who has the professional and the personal qualities which enable him to work effectively within a clinic organization ought to have the opportunity to do so, both for his own sake and for the sake of the public. If clinics are to be open to all patients who need them, they should be open also to all doctors who are capable of using them.

PUBLICITY

3. "Adequate information for the public of clinic facilities and the conditions under which clinic service can be secured" raises the question of publicity. The present official medical ethics "does not prohibit ethical institutions from a legitimate advertisement of location, physical surroundings and special class, if any, of patients accommodated." Such announcements must be made in ways which can reach the public who really need service. Announcements concerning clinic facilities are best made by joint action of public and semi-public bodies, such as medical societies, hospitals or public health agencies rather than by individual institutions, but in one fashion or another the public is entitled to this information. Such announcements should point out the importance of obtaining medical care and obtaining it as early as possible in the course of a disease. They should indicate facilities, including private practitioners as well as clinics. They should be specific, for the lay pub-

lic gets little from general advice to "go to your family doctor" in view of the patent fact that a large proportion of persons in cities have no longer a family doctor.

The health editor of a large newspaper in Chicago recently declared that in one year 40,000 inquiries came to his office, most of them asking how to find a doctor or medical agency for some particular need. The experience of the Metropolitan Life Insurance Company, reported by Dr. Donald B. Armstrong, testifies to the same fact, that information regarding reliable medical facilities is an urgent public demand. Modern resources of communication and publicity must be utilized to meet this demand. The medical profession and the public must coöperate in facing the problem and devising methods for its solution.

CONCLUSIONS

In summary, the present tendency of clinics is to expand in number and scope, to cease to be merely charitable enterprises and to become centers of medical service. In this, clinics are following the trend in which hospitals are already further advanced.

Further advance along this line will enlarge the power of clinics to serve the public. From the standpoint of the physician, it will substitute for an unpaid and often unsatisfactory service a properly compensated, dignified and efficient one. Only through such professional association with brother physicians as is made possible through clinic and hospital organization can the average practitioner find opportunities for doing the best work and for keeping abreast of the medical times. From the standpoint of the general practitioner the clinic is far more important than the hospital in this respect. Even if thus developed, clinics and hospitals together will by no means cover the whole area of medical practice. They will, however, be an integral part of it and not superimposed and sometimes conflicting elements. If clinics are open on a sound economic, i.e., self-supporting basis, to all the patients who need them and all the physicians who know how to use them, they will compete only with those professional men who are, congenitally or otherwise, unable to render good service.

There remains the larger question whether the principle of medical organization represented by clinics is itself sound, whether the whole trend of assembling doctors into organized staffs of hospitals and clinics is not abandoning the fruitful tradition of American individualism. The personal relations between physicians and patient must be preserved, and I believe they can be preserved within medical organizations. But will the morale and standing of physicians suffer, if they participate in hospital and clinic organization? Does participation mean submersion? That question is largely in the hands of the medical profession itself, for while the public is likely to insist upon the extension of the principle of organization in medical service, the public will be only too glad to leave to medical men themselves the management of their purely professional affairs. Certainly the Mayo clinic has illustrated the possibility of preserving within a large and complex medical organization the standards of good service, the stimuli towards scientific attainment and the highest levels of professional self-respect. In twentieth-century America, we can no longer expect the kinds of individualism typified by the sturdy isolation of the pioneer or by the lonely family upon the farm. We must maintain, indeed we must develop, individualism through organization.

Partnership between public and profession is the key to the solution of this problem. Neither the overriding of the profession by the public, as has been manifest in some legislative experiments abroad, nor antagonism on the part of the profession to changes in existing medical customs is desirable. Neither of these will serve. The advance of the science and art of medicine, on the one side, and the economic development of twentieth-century America, on the other, compel changes in the forms of medical practice. Leadership on the part of physicians in defining and guiding the professional aspects of these changes is essential. Participation of the profession and the public will then follow in the solution of their joint and necessary task.

A VAGINAL SPECULUM FOR USE IN CHILDREN

BY HERSCHEL HEINZ, M.D.*

NOW and then one sees in gynecological practice, a child with a vaginal discharge. The discharge may be due to a simple catarrhal condition, to gonorrhea, or, occasionally, to a foreign body in the vagina. In order to make a correct diagnosis and to institute proper treatment, the vaginal canal should be thoroughly inspected. Unfortunately, unless the gynecologist sees many of these cases and has specially constructed specula, the visual examination of the child's vagina presents obvious difficulties.

I have used an otoscope with a large-sized speculum, but with indifferent success, as the field is too limited. Confronted with the necessity, recently, of getting a good view of the vaginal tract in a child, I improvised a speculum from an ordinary nasal speculum. This gave better exposure than the otoscope but was still unsatis-

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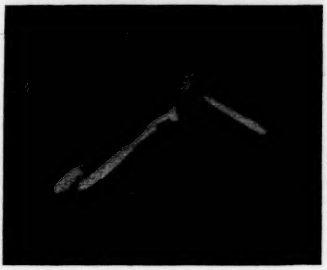
factory inasmuch as the blades were too short to fully reveal the cervix and vaginal vaults. Finally the nasal septum speculum was adopted as a simple, inexpensive, and easily procurable



instrument of sufficiently correct shape and size as to permit easy introduction into a child's vagina and at the same time give adequate exposure.

The instrument is well lubricated and introduced. The handle is held horizontally at right angles to the long axis of the vulva. The speculum is provided with a set screw by means of which the blades may be held open. For illumination an ordinary stand lamp is used, light be-

ing reflected into the vagina by means of a head mirror.

I recently used the instrument successfully in a child of nine years of age from whose vagina several pieces of toilet tissue were removed. Because of the irritation due to their presence the child had a foul-smelling vaginal discharge of a bloody character.

IMPROVEMENT IN THE QUALITY OF ANESTHETIC ETHER

Sulphuric ether for anesthesia has been under study by the Food and Drug Administration of the Government for several years. Whenever adulterated or low standard ether has been discovered it is removed from the market.

According to the standards adopted, ether for anesthesia must contain no peroxides or aldehydes.

Dr. Durrett of the Food and Drug Department reports that the quality of ether has been improving since 1926 at which period 34 per cent. was found to be low standard.

Of 3464 cans of ether examined in 1929 only 9 per cent. were sub-standard.

MOTOR FATALITIES

An insurance company has prepared certain statistics bearing on the fatalities incident to the use of the automobile under the title "worse than war" in which there is a comparison of the 50,510 men killed in battle and fatally wounded in the World War and the 50,900 persons killed by motor accidents in the United States in the past eighteen months with the added figures of 282,789 deaths in the past fifteen years.

In our Civil War of four years, 110,070 Union soldiers were killed or died of wounds while in the past four years the automobile deaths amounted to 117,532. Added to these distressing figures the number of non-fatal injuries was 835,250.

It has been computed that the motor vehicle mileage in 1930 was less by fifteen billion miles whereas fatal accidents increased between four and five per cent. and personal injuries about thirteen per cent.

Very much greater responsibility of accidents is accredited to drivers than to the victims and in 28,000 fatal accidents the mechanical condition of the motor driven by the offending drivers was good and in the great majority of accidents the drivers had had considerable experience in handling motor cars and were exceeding speed limits.

Sundays and clear days showed the heaviest death toll.

The correction of the causes of this appalling drain on life and coördinate suffering is simple in theory but impossible in a great proportion of cases until human nature undergoes a radical change. In addition to the growing importance of the contribution of the motor vehicle to the mortality rates, the employment of this agent by the criminal classes makes it an added menace to society and may with propriety be considered by the court in imposing sentence on a criminal just as the possession of firearms while engaged in robbery adds to the gravity of the crime.

It might be a small comfort if, as an offset to the deplorable conditions attendant on the use of motor vehicles, it were known to what extent the automobile has contributed to health, education, and happiness. If we were obliged to prohibit the use of motor cars, the return to former customs would be a calamity for those who use this method of transportation with discretion.

MEDICAL PROGRESS

PROGRESS IN MEDICAL EDUCATION*

BY WILLIAM D. REID, M.D.†

THE present trends in medical education have been summarized[1] as follows:

1. Reduction in the number of hours.
2. Liberalization of the course (by teaching only basic courses and utilizing the rest of the time for electives).
3. Teaching of the specialties only in their relation to the two main courses,—general medicine and general surgery.
4. Reduction in the number of didactic hours and an increase in the number of clinical hours.
5. Encouragement of the student to "self-education".
6. Better correlation of various subjects.
7. Elimination of duplication in teaching.
8. Development of teaching in out-patient departments.
9. Elimination of long summer vacations.
10. Substitution of a few comprehensive examinations for many departmental examinations.

The teaching of medicine may be discussed under three headings[2]:

1. The teacher.
2. The student.
3. The curriculum.

In the past the curriculum has received more attention than have the other phases.

Are we all sufficiently aware of current thought pertaining to medical education? Confident that the answer to this question must be "No," certain data that have been gleaned from publications on medical education will be presented briefly, for the dual purpose of conveying information and stimulating thought and discussion.

THE TEACHER

It has been said that the will to teach is the sole criterion that induces some men to teach. But surely there is more to teaching than this. Pedagogy is a science that may be studied and this should be just as true in medical schools as in other educational institutions.

Meakins[3] has summarized his conception of the ideal medical teacher, thus: "The ideal teacher in medicine should be one with a sound critical experience in clinical medicine. He should know men and humanity. He should also be well grounded in pathology, physiology, pharmacology, biochemistry, and—if it is not asking too much—have a working knowledge of biometrics, biophysics and biology; but the greatest of these is his knowledge of clinical medicine. You may say that it is difficult to obtain such. All discussion of the teaching of medicine is futile unless such teachers can be produced. It is useless to attempt to cut and polish a diamond without the diamond and the tools."

The value of the possession of a sense of humor has been emphasized. Musser[4] writes: "He should have a sense of humor. He should be able to see the ridiculous in dogmatic teaching. There is so little in medicine that is proven that to make a dogmatic statement is ridiculous, and a sense of humor in a man will keep him from making such statements."

Chipman[2] expresses himself thus: "I suggest that we have fewer teachers, say, half the number, and that we carefully select and train them. There are far too many demonstrators in every medical school. . . . While demanding more, we must be prepared to give more in the way of academic status, and even actual remuneration." As regards the payment of clinical teachers Musser[4] states: "A man who devotes a goodly number of hours a day to teaching should have a salary that will compensate him well."

The matter of the full-time medical teacher is still being discussed; Musser[4] is definitely in favor of it. Opinion appears to be growing in favor of salaries for clinical teaching, and of an increase in those paid to teachers in the non-clinical branches. There are stimulating articles describing the personal qualifications of teachers of medicine. Limitations of space preclude further presentation of these subjects.

THE STUDENT

In the years 1910-1926 there was a loss of 17.4 per cent.[5] of the students who enrolled in American medical colleges. Of these students who discontinued medical study 88.2 per cent. did so during the first two years; they dropped out mainly because of poor scholarship. This loss of nearly one-fifth of the student body is serious; that it is so regarded is, perhaps, one of the reasons that there have been so many papers published on the selection of medical students. It has been noted[6] that the percentage of failures during the first two years in medical school is practically as high as it was fifteen years ago, when the majority of medical students had only one or two years of college preparation. In 1929 three-fourths of the freshmen admitted to medical schools had had more than two years of college work[7], and 91.6 per cent. came from col-

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leges on the approved list, which now includes 549 institutions[8].

Students are commonly selected on the basis of a sufficiently high rating in (1) scholarship and (2) personality. Lynch[9] holds as essential to entry to the study of medicine "an analytical frame of mind built up to considerable maturity". He prefers that the prospective medical student first obtain a well-rounded and completed university education. However, there is a growing weight of opinion in favor of admitting students at an earlier age, on the basis of intelligence and character plus two years of college work. It should not be the number of credits, or mere exposure, so to speak, to certain studies, but evidence of having done superior work in the two years of premedical study now required, that should dominate in the scholarship aspect of the selection of medical students. Davison[10] writes vigorously in favor of the careful selection of younger, intelligent students, and believes that instead of lowering the present standard of physicians, it will probably raise it. There is much meat in his paper.

It is possible that the selection of suitable medical students might be facilitated, the present dissatisfaction with the content and quality of the prescribed premedical courses be lessened, and the average age of medical graduates be lowered, if the medical schools took over the premedical instruction. Such premedical instruction is now given by most of the British schools of medicine, and those in Canada.

"The average youth is lazy; if he is not, there is something wrong with him. It is a manifestation, if you like, of anabolic surplus, and rather a proof that he will last the distance. And it is, indeed, a 'gruelling' race that lies before him. He is lazy, and so in my judgment, a supervision, constant, watchful and covert is always requisite[2]." Some one has expressed the opinion that the average medical student needs to be driven somewhat, and that if given more supervision in his first years at medical school some of the loss from deficient scholarship might be prevented. During practically his entire premedical education he has been closely supervised and flounders when first accorded the freedom permitted in many medical colleges. On the other hand, Flexner[11] writes: "The medical student who needs to be 'controlled' from day to day, sometimes from hour to hour, has missed his calling.*" In Great Britain little time is wasted on inferior or non-industrious students. About thirty per cent. of the students in London are weeded out[12].

Flexner[11] and Rappleye[12], both of whom have devoted much time to study of the subject, are of the opinion that the student body in American medical, and also in other professional schools is not homogeneous in previous education or in degree of intellectual ability. This condition cannot be prevented until the preparatory schools are more uniform and of better average quality. Too many high schools and colleges in America pass nearly all and inculcate habits of laziness. Much effort is being expended by the dean's office to admit only such students as are suitable for the intellectual education of medicine. However, complete success is probably impossible, and, therefore, the faculty must realize the non-homogeneous character of their classes and allow for it in their teaching.

*P. 186.

THE CURRICULUM

There have been published so many good articles pertaining to the curriculum in medical education that it is difficult to select what is desirable without too greatly extending this review.

Methods of teaching. There are three methods of instruction that are most widely used: (1) the didactic lecture, (2) the demonstration, and (3) practical work, in the laboratory or directly on the patient. Each has its advantages and disadvantages; each has its advocates and its detractors.

It is apparent that of late years many minds have become doubtful of the value of the lecture. Lecturers should remember that their words cannot mean the same to their audience as to themselves. In their own case they have selected just what to say as the result of considerable personal work and thought; their hearers lack the benefit that evolves from such effort and thinking.

It is well known that effective speakers rarely speak on a subject exactly as they would write upon it. The requirements are not identical. From this viewpoint it is evident that good lecturing does not permit the mere repetition, sometimes even reading from a manuscript, of exactly the same words as are found in a chapter in a textbook. On the contrary, some of the details required in the written presentation should be omitted. The lecturer should hold his audience, put his own personality into his lecture, emphasize the important points, explain those that are likely to be misunderstood, and in the end so stimulate his hearers that they wish for more and become keen to read on the subject. There is an art to lecturing; it selects from, but intentionally omits some of the facts included in, the written presentation, from which, let us repeat, it properly differs. Such lecturing is as valuable today as ever in medical teaching.

In giving the results of his study of medical education in Germany, Rappleye[12] states: "The amphitheatre clinical demonstration provides an opportunity for the professor to influence and stimulate a large body of students. . . . The technique of laboratory work or physical examination cannot be mastered by looking at patients or listening to a learned exposition."

The assigned textbook recitation is unknown in Germany. Little depends upon "learning lessons" whereas most that is valuable is derived from initiative and interest. However, it is believed that there is value in the so-called "quiz method", if properly conducted by the instructor. He can teach the student to think and express himself clearly. A certain amount of humor can be introduced; occasional attempts may be made to lead a student astray by "trick" questions, or if he is already going astray, he may be permitted to go for a reasonable distance. As opportunity presents, a certain amount of argument between students may be encouraged, for, as Lord Moynihan[13] has well said: "It is the clash of one mind against another, the impact of one temperament against another, which does more good than all the other things in a university education." And above all, the instructor, by searching questions, can determine the stage of the student's knowledge, what points are already grasped and what need elucidation. The "quiz" method is of great assistance in stimulating the student to read, and can be made of distinct value if skillfully employed. In the final analysis, a great deal depends upon the instructor; a quiz as conducted by some is excellent but as employed by others should be abandoned.

Teaching by case histories is a feature of American medical education. If well done, it is an excellent method in suitable subjects. The technique is similar to that mentioned above as pertaining to the quiz, and is so well known as not to require further presentation. The clinical clerkship is probably the most characteristic feature of British medical training. It has been rather generally introduced into American medical education; its details vary but need not be presented here.

Correlation: Considerable attention is being given of late to the correlation of the various subjects pertaining to medical education. This is, perhaps, a reaction to the fact that previously there has been a tendency to place most of the subjects in so-called watertight compartments. In the third and fourth years it is becoming common to give courses in applied anatomy, physiology, pathology, etc.

In the British medical schools the various specialties are considered to be parts of medicine or surgery. The causation and prevention are stressed in all departments. In Rappleye's report[12] one notes that at Edinburgh in the third year an interdepartmental syllabus has been adopted, by means of which the students receive instruction on related subjects or different aspects of the same subject at the same time.

The subject of correlation has obtained considerable favorable discussion at the meetings of the Association of American Medical Colleges. Various methods have been suggested; one speaker made a significant statement when he said, that the will to correlate must be prominent in the instructors[14].

Meakins[3] would not have the preclinical teachers introduce the correlation of clinical subjects into their courses. He writes: "It is not the function of the physiologist or of the biochemist to teach so-called pathological physiology or pathological biochemistry. These subjects essentially fall within the realm of clinical medicine; in fact, they are medicine—and the staff of a department of medicine, at the present day, which cannot undertake this teaching is not equipped properly." At McGill each of the 60 lectures in medicine is followed by a clinical demonstration of cases to illustrate the subject of the lecture just preceding. This coördination within the medical department is said to be achieved with comparative ease.

Flexner[11] introduces a dissenting note into the discussion of correlation. He writes* that "in America too much attention is given to correlation . . . and to the working up of special exercises designed to present rounded . . . entities to the student, so that he (the student) may see things in relation, or to the simultaneous presentation of different aspects, so that he may be spared some of the toil of learning and some of the danger of forgetting. . . . It is more likely that, freed at graduation from the control of teachers who have done his thinking for him, he will relapse into the practical routine that is congenial to him."

It seems fair to assume, however, that correlation may be useful if it serves to increase the interest of the student in a subject of which, at first contact, he may not appreciate the value in his future practice. It need not, of course, be carried to the extent of doing all the thinking for the student.

Freedom. Flexner[11], as a result of his studies, admires the university type of freedom permitted to the medical students in Germany and germanic countries. He says, "The freedom of the student, however abused, is the most precious element in university life on the continent."

One gleans some forcibly expressed sentences from his report: "In any event, elasticity which at times deteriorates into chaos is, on the whole, preferable to a lock-step which keeps able and unable, energetic and industrious, clamped within the same form, practically without individual responsibility."

"The American student is annually held accountable for certain 'courses', as against the preferable continental way of holding him accountable, after the lapse of a variable number of years, for the mastery of a subject, however such mastery may have been acquired. Other marks of the old-fashioned schoolmaster are also present, for attendance is recorded and certified by instructors and lecturers to the dean."†

*P. 146.
†Pp. 130, 131, and 144.

Harvard has reduced the required hours during the first three years by about one-third. Flexner commends this step and estimates its effects upon the students to be somewhat as follows: "The able student does more, the conscientious student of moderate ability is under less pressure, and the inferior student is more properly left to his own resources."

Rappleye[12] is not so cordial to the freedom accorded to German medical students. He is of the opinion that the freedom that the students have in arranging their schedule tends to nullify the usefulness and serious content of the basic sciences.

German medical students are also permitted to migrate from one school to another. On this Rappleye[12] writes, "It is frequently alleged that the students move from one city to another to secure advantages in instruction in certain subjects which may be particularly well done in certain places. There is little to substantiate this claim except in the case of a few clinical men whose reputations attract students. The average student usually has no way of learning of the reputation or ability of teachers in the sciences and little opportunity to learn of clinicians. Conversations with professors, students and assistants make it clear that other motives explain the free interchange of students. They move about to see different parts of the country and the large cities, for seasonal sports, for art or climatic reasons, for clinical opportunities, and a considerable number to take their laboratory work and last semester before the examinations in a school where the examinations are known to be easy."*

In view of the importance of the principle of freedom in its relation to medical education it seems justifiable to give further quotations from the literature. Material must be included sufficient to illustrate differing points of view and to facilitate, it is hoped, sounder conclusions as to how much or how little freedom should be permitted in the education given to medical students.

Lynch[9] writes: "I would give him sufficient time to mature in the medical atmosphere, but not secluded from the world by occupying him week in and week out, day in and day out, with medicine. I would allow him time off for contact with the outside. Is not that what vacation time is for during the medical course? Is it not for loafing and light play?"

Another quotation[15]: "There is a distinct shift in many medical schools now toward placing greater responsibility on the student for his own training in an effort to emphasize learning by the student in distinction to teaching by the faculty. It is in the direction of individualizing instruction and providing opportunities for learning, for self-development and independent work. This new emphasis is illustrated by the breaking down of the rigid class system; the discontinuance of uniform time and course schedules; the introduction of small teaching sections; personal contacts between students and instructors; provision for reasonable free time for reading, individual work and leisure; a reduction in the amount of lecturing, and the providing of opportunities for students who desire, and are competent to do, independent work. The aim is to develop minds capable of finding and appraising evidence and drawing conclusions based on sound reasoning which will provide a permanent intellectual equipment, resourcefulness and sound habits as well as methods of study that will permit the student to continue his own self-education throughout his entire professional life, a continuing education which has already been emphasized as the most important factor in providing an adequate medical service for the community."

A note of warning is uttered by Colwell[8]. In his discussion of experiments in medical teaching Colwell states: "Certain others have provided an extreme degree of elective work, and placed an unjustified degree of responsibility on the individual student, apparently without providing the essential supervision through consultants or advisory committees, such as are usually provided for graduate students. Institutions adopting such extreme methods should not overlook the first duty of a medical school —that of providing its students with a thorough grounding essential for every practitioner of the healing art. Another danger in some medical schools is the too early drift by the student into some narrow specialty and his failure to obtain the broad training which is fundamental to any specialty. Without this essential foundation the physician is not in position to make a satisfactory or dependable diagnosis from the general practice point of view."

Examinations. It is doubtful if methods of examinations have yet been developed which are entirely successful in grading the students. It is well known that the analyses made by students of the examinations given in previous years are fairly successful in determining the nature of a coming examination. The method of cramming may enable a student to pass, but does this result in a proper mastery of the subject? The matter of examinations has been critically studied from time to time; teachers should be interested in the published reports of such studies.

In the British medical schools there is the interesting custom of having the students of one school examined by teachers from another. Both written and oral examinations are given; the latter is considered of special value in disclosing the student's readiness to express himself clearly.

It is planned at the new medical school at Duke University to give comprehensive group examinations in the preclinical subjects when this part of the course has been completed, and in the clinical subjects at the end of this sec-

*Pp. 62 and 70.

tion of the curriculum. In his description of these two group examinations, Davison[10] states: "They would demand a more comprehensive knowledge of medicine than could be obtained from the required courses in the schedule, and it would be necessary for the student to demonstrate that he had profitably utilized his free time."

A committee studied the problem of examinations at Harvard Medical School with illuminating results. "They brought out clearly the inadequacy of most of the memory tests to which the students had been previously subjected. A knowledge of figures and facts had to be supplemented by a clear understanding of the manifold relationship between the many items. 'Correlation' became the keynote. Since then, such broad questions as 'Discuss milk,' 'Discuss jaundice,' or 'Discuss the functions of the blood' aim to test the student's ability to arrange his knowledge in an orderly fashion and to correlate normal structure and function with the causes, the mechanism, and the symptoms of disease[16]." Rackemann finds that the introduction of this type of examination has proven very valuable: "Students and instructors alike have been forced to regard their laboratory studies in the light of the clinic, and their clinical observations in the light of the laboratory, with tremendous benefit to all concerned[16]."

Miscellaneous. It has been aptly said: "Education, in its etymology, means not at all a pushing in, a cramming with information—but a leading or a drawing out of the faculties that we possess[2]." And: "Old as we are, experience, a practical experience, is still the greatest teacher."

"Though medicine can be learned, it cannot be taught." In other words, the student must not be passive, but must be induced to work. It has been said that every educated man is self-educated. "There is no substitute for the learner's initiative."

". . . Good teachers accomplish most, not by consuming their time and energy in over-elaboration that does everything for the student, but rather by the vigor, originality, and freshness with which the day's theme is expounded without being exhausted*."

All branches of science have grown so vigorously and have put forth so many offshoots that the question now, to quote Berglund, is, "what to teach and what to skip".[10] It has been said, "It is impossible to set aside any definite set of facts or skill as constituting the 'best' training in medicine. The habit of inquiry, the ability to use the senses, and the capacity for well-directed effort are the more important points to be inculcated*."

In similar vein write other educators: "It is the duty of teachers not only to supply 'facts' to students but to help them to train their minds[17]." In his discussion of the danger of giving too many facts, Hawkes[18] reminds us: "The fact is that the letter killeth; it is the spirit that keepeth alive." In respect to what marks successful teaching, Oertel[19] states: "I deem it a greater success of teaching to turn out an uncertain, but properly inquiring mind, than a mind certain of, and filled with temporary knowledge, but fixed and sterilized."

C. P. Emerson[20] offers some rather unusual suggestions about the arrangement of the subjects in the present curriculum. These may be illustrated by quoting his words: "A test learned before the student knows the clinical problem of which it is the test will have created in his mind a definite bias which will make objective observation difficult. It takes some time to grant that, although a patient has had lues, the illness which now brings him to a hospital may be some quite different disease." "Only the unusual preclinical teacher will resist the temptation to illustrate his subject by 'possible practical clinical applications'." "For that reason much of biochemistry, serology, etc., and experimental pathology should come during the last semester of the senior year, when they afford explanations of clinical phenomena of which the student already has some definite idea. Why should the explanation precede the question?"

The proper use of the laboratory and instruments of precision is well expressed by Hoover[21]: "To me it seems indisputable that if a keen bedside observer engages in laboratory experiment or in the use of instruments of precision to explain or confirm his clinical conceptions, it can lead only to accuracy in physical diagnosis and sharpened bedside perspicuity. If instruments of precision supplant physical diagnosis, there is an obvious confession of diagnostic weakness. If science dulls our wits, then we own a witless science. This has actually occurred in some schools where teaching chairs are occupied by immature clinicians whose diagnostic training has lagged behind their diagnostic skill."

The value of reading is stressed by Lynch[22]: "Every student should be urged to acquire certain habits even before he enters medical school. One is that of the intelligent use of works of reference. A medical student, to develop into a really successful man, must know how to use a library and must use it, constantly. If we see to it that every student learns to read intelligently and with an end in view, many of our teaching problems will disappear. Among them will be the problem of the use of the large amount of free time in our curricula, a difficulty needlessly troublesome to many schools."

It is always possible that the individual members of a large group of teachers may not agree on certain minutiae. This may have its value in disclosing to the student that all is not fixed in medicine and, since the different opinions cannot all be accepted, in inducing them to think for themselves. Meakins[3] believes that the various opinions should be stated to the students,

*Flexner: Medical Education, pp. 138, 146, and 148.

the evidence pro and con being given for each and the whole subject thrown into a proper perspective. "In this way there is removed the confusion of mind which the student often has from hearing different teachers giving divergent opinions on matters which are usually of small importance. For how can the student differentiate these apparently erudite but unimportant matters and those of the utmost value unless he be told?"

Sir E. Farquhar Buzzard[23] contrasts the type of mind acquired by a medical rather than the average lay education. "The physician has been trained in precise methods of investigation, has learned to think scientifically, and to speak in scientific terms, to distinguish between facts and theories, to regard *a priori* conceptions with suspicion, to appreciate the value of experiments and controls, and generally has developed a critical faculty of which the lay mind is completely innocent." If all this is really acquired by the physician, it may be granted that the school at which he obtained his medical education has fulfilled its mission.

Length. Many medical educators believe that the age at which physicians graduate—now averaging 26½ years[24]—should be lowered. About 90 per cent.[5] of medical students in 1929 and 1930 added one year internship, mostly voluntarily. The use of the summer vacation as part of the medical school year has been strongly advocated[10] and permits the completion of the medical course in three years. This so-called four-quarter system has been put into effect in five medical schools[5].

On the other hand, other educators are opposed to this. Lynch[9] writes: ". . . I find no urgent reason for haste in medicine. Rather, I would slow us up and give the opportunity for plumbing greater depth." Findlay[25], an English physician, expresses himself thus: "Instead of curtailing, as some reformers suggest, the number of sciences which we have been wont to learn, or at least given an introduction to, the number of subjects and period of our study should be increased. Instead of five years, the medical course should, as it already does in Sweden, extend to seven or eight years."

It is normal to forget. About 50 per cent[26]. is forgotten, or relegated to our subconscious mind, in a few months. The really important facts can be relearned by repetition. It is also asserted* that the teaching of a subject that is spread over a long period and taken along with other subjects is far more effective, in the long run, than when it is concentrated in a brief space of time.

There are two points that stand out in the current discussions of medical education: (1) the difficulty of selecting suitable students, and (2) the difficulty of giving them an adequate medical education. It is possible that the solution lies in taking them earlier and keeping them longer. Thus, in Canada and in England, the students are admitted at the time they are ready to enter the university and the premedical instruction is given by the medical school. If formerly four years was deemed sufficient for the course in medicine, does not the growth of medical science make it worthy of consideration that an additional year is now necessary? Time for the latter can be obtained if the premedical education is taken over by the medical school and limited to the prescribed two years.

*Rappleye. Medical Education and Related Problems in Europe, p. 27.

COMMENT

It is realized that the nature of the foregoing presentation or review of medical education has led to a certain amount of overlapping of the material under the various headings. Such could not be easily avoided. In addition, in spite of the apparent length of this selection from the literature on medical education, it is pointed out that it was considered necessary to omit many interesting items.

No definite conclusions are drawn. The purpose has been to convey information, arouse discussion and stimulate thought. It is intended that the reader be given an opportunity to form his own opinions. A reasonable number of pertinent references to articles have been cited wherein the reader may find further discussion of the various points, if desired.

It is emphasized, however, that it is considered that the teacher should employ those methods in which he believes and for which he is adapted. The principle of academic freedom is not to be discarded.

To whose who find it difficult to consider changes in medical education may we quote M. H. Fischer[27]: "Instead of so much or more uniformity, we need more individuality and more internal courage in our medical schools."

It may be well to conclude this review by quoting from the third annual report of the Commission on Medical Education. This report calls particular attention to: "(a) The tendency to prolong unnecessarily the student's period of preliminary and professional education; such shortening of existing courses as may be possible and the saving of time by the use of overlong summer vacations is strongly urged; (b) the overcrowding of the curriculum with nonessential details; the overemphasis placed on laboratory procedures; the unnecessary duplication of teaching through a failure to correlate laboratory work with clinical teaching; (c) the undue emphasis in medical teaching which is laid on the separate organs and systems which make up the human body rather than considering man as a complete living human being; this is resulting in a marked and dangerous trend toward specialization; (d) the need of more and

better systemized instruction in preventive medicine; (e) the hindrances to medical education resulting from unwise legislation or rulings of boards or agencies, which, in effect, assume prerogatives belonging to the medical schools; (f) the desirability of providing the student with more time to think and to use the library in reviewing current and reference literature; and (g) the advisability of more electives in the curriculum[5]."

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RUMANIA'S CHILD-WELFARE EXPOSITION

The Children's Bureau is sending a number of pamphlets, charts, and posters to the first Rumanian child-welfare exposition, which will be held at the Park Carol, Bucharest, from April 23 to May 23, 1931. This exposition is being organized by the Society "Prince Mircea," which was started by Queen Marie soon after the World War to carry on child-welfare work and which now has branches in the larger towns and in many villages in Rumania. Little or no work of this character had been done in Rumania before the war. The exposition is under the direct patronage of Queen Marie. Her daughter, Princess Ileana, is its president. It will cover the problems of child hygiene, child labor, and recreation, and will include an educational section and an exhibit of children's clothing and foods.

The Rumanian Government hopes that this exposition will promote in its country the same type of work for children that is being done by the United States Children's Bureau and other public and private child-welfare organizations in our own country. Its Legation in Washington has indicated that the coöperation of such organizations and of commercial firms dealing in articles used by and for children, in sending pictures, posters, pamphlets and other material giving information on child-welfare methods for exhibit at Bucharest, will be greatly appreciated. Word also comes from the Legation that a group of young women will later be sent from Rumania to study the child-welfare methods used in the United States.

Further information concerning the exposition may be had by addressing Mr. F. C. Nano, Counselor of the Rumanian Legation, Washington, D. C.—*U. S. Children's Bureau, Washington, D. C.*

NEW YORK SHOWS A COMMENDABLE IMPROVEMENT IN THE MANAGEMENT OF DIPHTHERIA

Whereas the economic loss caused by diphtheria in New York City is estimated to have been $127,712,000 in the twenty-year period prior to 1930 with the deaths of about twenty thousand children or an average of more than six million dollars a year a remarkable change for the better was shown in 1930 when this loss was cut to $1,409,000.

These figures were made known by the Diphtheria Prevention Commission after a survey of the activities of this organization. In the last year of this period the number of deaths was 198 as compared with an average of 991 each year in the twenty-year prior period; a decrease of seventy per cent.

In estimating the economic loss, $100 was regarded as the loss per case and that of a death was $200. The $100 figure was estimated to be the expense of doctors, nurses and medicine and to this in the case of a death another $100 was added for funeral expenses. These figures seem to be below the actual expenditures.

The economic loss of a life ($5,000 per person) was based on the estimates of public health experts and life insurance statistics.

No money value can really cover the saving in grief and anxiety due to the loss of a life. This disease would be practically eliminated if the advice of health authorities regarding the universal use of toxin-antitoxin very early in the life of children were followed.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 17121

SIXTEEN MONTHS' COUGH WITH FOUL SPUTA

SURGICAL DEPARTMENT

An American engineer thirty-three years old entered December 1.

In August, sixteen months before admission, he had tonsillitis and a severe cold during the course of which he raised foul-smelling sputum and once a little red blood. His physician said he had pleurisy and that the bad odor was from his stomach. X-rays taken at a hospital showed nothing definite. He continued to have cough and sputum. Each effort to be up and about made him cough a great deal. In October he went to another hospital where x-ray examination showed a pathologic condition in the right lower lobe. In December he left the hospital and remained at home until the following June. In general his course was with up and down temperature, cough and considerable foul sputum. In February he went back to the second hospital, where a right phrenectomy and a bronchoscopy were done. In June he went to a sanitarium where for the first six weeks he was very well. Then the cough recurred. In July lipiodol x-rays and injections showed trouble in the right middle lobe. In September he shot a very high temperature and ceased to raise pus. Cocain was put into the bronchial tube with a medicine dropper. Following that he raised a kidney basin full of pus. He had what was apparently a violent heart upset, thought by his physician to be due partly to nervousness.

Clinical examination showed a well nourished, nervous man in no great pain, frequently coughing and raising foul-smelling sputum. The skin was somewhat grayish. The heart examination was essentially negative. The artery walls were palpable. The lower right chest in front up to the third rib showed flatness with absent breath sounds and voice sounds. The right back showed coarse breath sounds in the region of the fifth and sixth ribs and flatness at the base. The abdomen, extremities, pupils and reflexes were normal.

The amount of urine is not recorded. The specific gravity was 1.017 to 1.032. There was no albumin. All of three sediment examinations showed rare leukocytes. The blood was not recorded at admission. The sputum was purulent and showed many pus cells, no blood or tubercle bacilli.

Before the bronchoscopy the temperature and respirations were normal, the pulse 74 to 119.

X-ray examination showed coarse, rather confluent mottled dullness occupying the region of the right middle lobe. The mottling was irregular in outline. Surrounding it were several indefinitely defined areas of metal-like density, probably representing lipiodol. Within the mottled area there was a faintly defined, rather irregular area of diminished density which had the appearance of a small amount of air within the abscess cavity. This area shifted in position as the patient was shifted. The right side of the diaphragm was unusually high, but moved fairly well with respiration. The left side of the diaphragm and left lung were normal. Stereoscopic and lateral views confirmed these findings. In addition to the pathology in the middle lobe there appeared to be a rounded area of density below it in the anterior lower part of the lower lobe.

December 6 a medical chest consultant reported, "The physical signs are very definite and sharply limited to an area defined by the third rib, the inside of the nipple line and the diaphragm on the right. . . . There is a peculiar squeaking systolic murmur at the aortic area." A heart consultant reported, "The heart is probably completely normal. The symptoms of palpitation and dyspnea are undoubtedly due to the nervous condition, poor health and some unimportant cardiac arhythmia (premature beats and questionable short paroxysms of tachycardia). Reassurance is of chief importance. There is a slight but definite late systolic murmur just below the aortic area to the right of the sternum which may be due to some abnormality of the right pulmonary arteries associated with the pulmonary disease. This is of academic interest only. The heart is able to stand anesthesia and operation except that he is apparently very sensitive to cocain." A laryngologist was asked as to the advisability of bronchoscopy and reported that he would like to do at least one for diagnostic purposes and be guided by it as to further treatment. He thought the patient able to stand it. A nerve consultant reported that the patient had developed a neurotic state with anxiety symptoms, fears, unpleasant somatic sensations, restlessness, tremors, etc. He had a great fear of bronchoscopy, but the neurologist thought he was equal to any procedure the surgeons thought advisable.

The patient's mental attitude improved considerably. December 16 bronchoscopy was done, and December 20 operation. The patient was in satisfactory physical condition after it, but extremely neurotic. The temperature ranged from 97.8° to 102.2°, the pulse from 109 to 130. A culture from a swab from the lung showed no growth. December 31 a trocar thoracotomy was done and a large amount of foul-smelling pus

removed. Following it the temperature was 100.9° to 103.2°, the pulse 125 to 135, the respirations 28 to 35. A culture from the pus from the chest showed no growth. The leukocyte count was 29,350. Four days later the patient looked miserable. A blood culture showed contamination in one flask, no growth in another. From this time the temperature was swinging, from 98° to a terminal 104.5°. January 5, 600 cubic centimeters of blood was transfused. January 7 the temperature was 104.5°, the pulse 150, the respirations 50. January 8 the patient died.

Clinical Discussion

BY RICHARD C. CABOT, M.D.,
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GEORGE W. HOLMES, M.D.

NOTES ON THE HISTORY

Dr. Cabot: Whenever the words "foul-smelling sputum" occur in a record we feel pretty sure of the diagnosis provided we are confident of the accuracy of the person who uses the term. It is a very important thing. People with ordinary colds, upper respiratory infection, or even with tuberculosis or pneumonia, do not raise foul-smelling sputum. It comes from nothing except bronchiectasis and abscess of the lung. Sometimes the abscess is secondary to cancer of the lung; still it is from the abscess that the foul-smelling sputum comes. So we always, if we have the chance, try to make doubly and trebly sure that it does smell badly. When you do get a chance to smell this sputum you will agree that it is quite an experience. There is nothing quite like it. It can easily make a ward unendurable for other patients. Usually they put the patient in a separate room. I do not know about the facts in this case, but if the facts are truly stated, then we have already a pretty good certainty of abscess of the lung.

Of course a little red blood once is not significant.

"His physician said that the bad odor was from his stomach." Whatever else may or may not be true, you can be perfectly certain that this is not true.

He had periods without symptoms, which is just what we expect. Those are the times when the abscess was fully drained by effective coughing.

High temperature and ceasing to raise pus—that is the usual combination. Together with the x-ray evidence of the previous July it points to abscess, you can be sure.

NOTES ON THE PHYSICAL EXAMINATION

We have the cough and foul-smelling sputum verified in the examination, so I have no considerable doubt of the diagnosis so far.

That physical examination is perfectly consistent with abscess. Almost any physical examination is consistent with abscess. It depends upon the size and position and upon what else there is around it. If there is a small abscess centrally placed there may be no physical signs to speak of. X-ray may be the only thing to reveal it. On the other hand if there has been a great deal of reaction about the abscess and especially if there is infection of the pleura, we get signs like these. I have very little doubt that the pleura is infected from what we are here told.

That high position of the diaphragm may account for some or all of the flatness at the right base. We have to remember that when there are signs like fluid at the base, especially at the right base, we are likely to be percussing over the liver and think it to be the lung.

Up to the end of the x-ray report we have evidence for a diagnosis of pulmonary abscess and for nothing else so far as I know.

DIFFERENTIAL DIAGNOSIS

We shall have to commit ourselves as to what the operation was;—pulmonary abscess, very probably with infection of the pleura, but probably not with any considerable amount of fluid in the pleural cavity; adhesions both about the abscess and in the pleura. I do not see that we have any indication of anything else than that.

Preoperative Diagnosis December 20

Multiple abscesses of the middle lobe of the right lung.

First operation. Sections of the third and fourth ribs were removed. The pleura and the lung were found adherent. Aspiration obtained thick pus. A multilocular cavity was opened into containing pus and considerable necrotic lung. This area was cauterized lightly.

Further Discussion

Dr. Cabot: So far then our diagnosis is confirmed.

Isn't the fact that the culture from a swab from the lung showed no growth rather surprising, Dr. Mallory?

Dr. Tracy B. Mallory: Yes. Many of the organisms in these lung abscesses are anaërobic, spirochetes and fusiform bacilli, for instance.

Dr. Cabot: Ordinarily in abscesses we find three or four dozen kinds of organisms growing.

The operation showed the diagnosis. All we have to do, as far as I see, is to speculate about the complications. What can we get in the way of complications with an abscess of the lung like this?

A Student: Septicemia?

DR. CABOT: Yes; maybe generalized.

A STUDENT: Pneumothorax?

DR. CABOT: I think that they ought to have found that out if it had been there. It would be strange to discover that at autopsy and not before.

A STUDENT: Empyema?

DR. CABOT: Perfectly possible. But that again ought to have been found in life.

A STUDENT: How about pneumonia going to the other lobe?

DR. CABOT: There is nothing to suggest it. We should expect in that case an acute increase of symptoms. Yet I do not know how to rule it out.

A STUDENT: Erosion of a vessel with hemorrhage?

DR. CABOT: We are not told of hemorrhage, are we?

A STUDENT: Might a cerebral abscess be responsible for the neurotic symptoms?

DR. CABOT: Good. You know how common it is to get metastasis from the lung to the brain. That is one of the favorite metastases. But if cerebral abscess causes symptoms like these it is new to me. I do not believe it. Usually it causes symptoms like tumor, localized focal symptoms. If he had cerebral abscess we have no right to say so on the basis of the symptoms.

Amyloid of the spleen, liver or kidneys might properly be considered. There is no evidence of it, however. I should not suppose this trouble had been going on long enough. It is not often found. It is a very unsatisfactory and difficult diagnosis to make.

I should agree with what has been said by the cardiac consultant. There was probably nothing there on the aortic valve.

A STUDENT: Do you expect anything in the liver to account for the high diaphragm?

DR. CABOT: I should not. I should think the trouble in the lung is enough to account for it.

A STUDENT: The lesion in the lower lobe was probably the first abscess?

DR. CABOT: I should suppose from the account there that the process started in the middle lobe. I do not know what to say about that process in the lower lobe.

DR. HOLMES: This shadow is in the region of the hilum of the right lung. The shadow is quite dense, I think, with rather indefinitely defined margins. The diaphragm on that side is rather high. In the lateral view you see the same shaped shadow, showing that it is in the middle portion of the chest and a round solid mass. I have only the posterior view. There is no evidence of involvement of the pleura. The heart is in the normal position. A tumor mass in that region, for instance, might displace the heart. A tumor mass arising in the bronchus and plugging it might cause a displacement of the heart towards the affected side. About all we can say is that there is an area of consolidation in that part of the lung. In some of these films there is a suggestion of a bright area with a sharply defined lower border which suggests a fluid level. We have not the large bright areas which are characteristic of a large abscess, but this might represent multiple small abscesses.

These next two films were taken three or four weeks after the first one. They are "portable" films taken with the patient lying on his back. That does not account for the whole change. The upper part of the right lung field is very bright and there are no lung markings present. That is the appearance of pneumothorax. The heart and the trachea are displaced away from the lesion. It may be that this is an artificial pneumothorax with pressure in an attempt to collapse the lung. We have evidence of increased pressure on this side of the chest. But still there is no evidence of a cavity, and we should not expect it in a film taken with the patient in this position.

DR. CABOT: I was asked before you came in about the high diaphragm and I said I supposed it was due to abscess. But I do not know exactly how an abscess brings about a high diaphragm.

DR. HOLMES: I think your statement is correct. It is due to the lesion in the chest. We have some additional evidence in that the intercostal spaces are narrow on this side compared with the other. These films were taken on full inspiration. The patient was asked to take a deep breath. He was using the left side of the chest and not the right. The diaphragm went down on the left and not on the right. If a film were take on expiration the diaphragm on the left would probably be higher than on the right.

DR. CABOT: Why doesn't the diaphragm go down on the right side?

DR. HOLMES: It probably hurts the patient to breathe, and the air does not get into the lung on that side so well. There is interference with the flow of air into the protected side.

DR. CABOT: There was some question in the text as to involvement of the lower lobe. At first they thought the process was in the middle lobe. Later they thought it was in the lower also.

DR. HOLMES: Originally it was seen in the middle lobe. I think in the posterior view we cannot be at all certain whether we are dealing with the lower or the middle lobe because of the overlap. But in the lateral view the middle lobe lies anterior to the lower.

A STUDENT: A phrenectomy was done on the right side. Doesn't that explain the diaphragm?

DR. HOLMES: Of course there are a number of things that might cause a high diaphragm besides the ones that I have mentioned. Both of these conditions that you have brought forward may easily do it. But adhesions between the diaphragm and the base of the lung are rare. It is rare to find evidence of it by x-rays and I think that as a rule it is not likely to cause much elevation of the diaphragm. Destruction of the

phrenic nerve produces a very high diaphragm and paradoxical motion.

DR. CABOT: They would probably have mentioned that in our x-ray report if they had seen it.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Lung abscess.

DR. RICHARD C. CABOT'S DIAGNOSIS

Lung abscess.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Multiple abscesses of the lung.

2. *Secondary or terminal lesions.*

Acute endocarditis of the aortic valve.
Empyema.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: We found a lung abscess, and as is usual in these cases, we found a number of them. The largest and oldest abscess without question was in the middle lobe. Practically the entire middle lobe was destroyed in the process. There were multiple small abscesses in the right lower lobe. Evidently a more recent process and in all probability secondary to operation was an empyema. We found two collections of pus, one between the diaphragm and the lower lobe, the other overlying the right upper lobe. The intervening portions of the pleural cavity were obliterated by fibrous adhesions. The left lung was essentially negative.

The only other finding was a common one in these cases. That was an acute endocarditis of the aortic valve. I cannot say how long it had been present; not necessarily very many days and certainly not many weeks.

DR. CABOT: We had a murmur there that we were rather puzzled about. It was conceivably due to that acute endocarditis.

A STUDENT: What organism was found?

DR. MALLORY: We did not obtain any growth.

DR. CABOT: If the operator had known beforehand just what was the condition, would the operation have been justified?

DR. MALLORY: I think that if he had realized that the lower as well as the middle lobe was involved he would have hesitated to interfere. I am not sure, however, that the lesion in the lower lobe was present at the time of operation.

DR. CABOT: Have you known of recovery from a lesion in the middle lobe like this?

DR. MALLORY: Yes; in a case where the abscess lies well out at the periphery. If they can drain from the periphery and the pleural cavity is already completely obliterated, the operation ought to be successful. The fact that the cavity was not completely obliterated here was one of the reasons why they had difficulty.

DR. CABOT: Will you say a few words on the successful treatment of lung abscess by surgery?

DR. HOLMES: I can only say that I have seen a number of cases of lung abscess get well without any form of treatment. I think, just as Dr. Mallory has said, that the location of the abscess makes a great difference in the success of treatment by the surgeon. This abscess was not in a favorable location for that. The case in which the abscess is near the periphery so that the surgeon can go directly to the abscess without having to pass through the lung tissue or run the risk of empyema is certainly the case he prefers. Whether I have seen just this type of case recover I cannot say. The general risk is much greater at least.

A STUDENT: May not this have been caused by actinomycosis due to sulphur granules?

DR. CABOT: Isn't it true, Dr. Mallory, that you would usually find something in the rib itself, not merely in the lung?

DR. MALLORY: No, I do not think so, in a pulmonary case. The cases I have seen have not had a notably foul sputum. I think this case has no right to be actinomycosis.

CASE 17122

PERSISTENT BILIARY FISTULA

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. RICHARD W. DWIGHT*: This patient was a fifty-eight year old man who was admitted to the West Medical service in September. He had been well until six months previously, when he awakened one morning with a sharp cramp-like pain under the right costal margin, so severe that he doubled up with it. The pain lasted for two days, off and on. He was well until three months later, when he had a similar attack. With this he vomited. After that the pain recurred two or three times a week, more and more severe, non-radiating and often accompanied by vomiting. For two weeks before entry the attacks had been particularly severe and frequent. He was unable to lie on his back in bed even in a severe attack. For three days he had noticed dark urine, and he had been told that he looked yellow.

Physical examination showed a well-built and well-nourished man, moderately jaundiced, with acute spasm and tenderness in the right upper quadrant.

The red blood cell count was 5,000,000, the smear normal, the white blood cell count 15,000. The non-protein nitrogen was 24 milligrams. The icteric index was 25, the van den Bergh test 4.12, biphasic. One Hinton test was weakly positive and another negative. The sedimentation rate was 45 millimeters. The bleeding time and clotting time were normal.

*Senior interne on the West Surgical service.

A plain x-ray film of the abdomen showed no stones.

He was transferred to the surgical service at the end of a week and operated upon. The gall bladder was enlarged and thickened. There were numerous adhesions. The gall bladder contained little bile but numerous stones. It was removed from above down. As the cystic duct could not be completely isolated no ligature was placed around it. No stones were palpable in the common duct. One cigarette wick was placed in the right kidney pouch.

The patient went into shock the same day and was transfused. On the fifth day there was free bile drainage from the wound. He also developed a cough with sputum and clinical signs of a pulmonary complication on the right. X-ray showed both costophrenic angles hazy. There was a suggestion of fluid on the left.

His chest cleared and he felt better in a few days, but continued to drain bile. On the twelfth day a catheter was put in the sinus and the bile collected. He drained from 8 to 15 ounces a day. A part of this was given to him by mouth. He continued to improve gradually. He had a chill and a fever of 103° on the thirty-fifth day after operation, but his temperature came back to normal. He was discharged home on the thirty-eighth day, still draining all his bile, which he was to collect and take by mouth at home.

Four weeks later he returned. He had done well for a week following discharge and had been able to collect and take about 12 ounces of bile a day. Then he came to the Outpatient Department and had his catheter changed. The new tube did not fit well and caused pain, so the patient removed it and collected no more bile. From that time he was unable to keep any food down. For two days before entry he vomited all fluids also.

Physical examination showed the patient to be very emaciated and dehydrated. The lungs were slightly dull at both bases. There was a large, hard, somewhat tender mass occupying the right upper quadrant with the biliary fistula at its center.

The white blood cell count was 18,000, the red cell count 6,000,000. The sedimentation rate was 16. A van den Bergh was 175. The serum protein was 6.8. The chlorides were 544. The non-protein nitrogen was 38.

The patient was kept in the ward four days and given a constant intravenous and a special diet. The bile was collected and administered. He vomited nearly everything he took by mouth. A jejunostomy was decided upon and performed under local anesthesia. A diet of peptonized milk, orange juice, liver and glucose, 3600 calories, with 96 ounces of fluid, was given through the jejunostomy and well tolerated. The bile was also reintroduced by that route. On the second day after operation there were signs of collapse at the right base. An x-ray taken then showed homogeneous dullness on the right suggestive of fluid. In spite of this the patient improved quite markedly and felt much better.

On the sixth day after operation the bile drainage practically ceased, only clear mucus coming from the sinus. The patient became very jaundiced. The van den Bergh rose to 9 and then to 12. The non-protein nitrogen and the chlorides remained normal. The serum protein was 4.6 to 5.4. This cessation of drainage lasted about eight days. The patient also had several chills and a temperature of 103° with each. Another x-ray again showed probable fluid. The patient was tapped on the right side of the chest. Two successive taps yielded 1200 cubic centimeters each of cloudy yellow fluid, specific gravity 1.018, 30,000 red blood cells, 100 white blood cells per cubic millimeter.

The patient was better after this. Bile drainage began again, reaching 10 ounces a day. The van den Bergh fell to 7 and later to 4. This improvement lasted for several days. Then the condition suddenly changed for the worse. He became quite edematous and started vomiting blood in small amounts. The hematemesis increased rapidly and fresh blood was passed by rectum. On the twenty-third day after operation the patient died.

Clinical Discussion

Dr. Robert R. Linton: At operation I found an acute gall bladder with the omentum wrapped around it. This was quite evidently an acute process, therefore I did not explore his abdomen. The gall bladder was distended and on aspiration yielded pus. There were numerous stones in it. It seemed advisable to take out the gall bladder from above downward rather than vice versa, as it was impossible to palpate the cystic duct. The cystic duct seemed to disappear in what I thought was inflammatory tissue surrounding the common bile duct. I was able to get my finger into the foramen of Winslow and made sure there were no stones in the common bile duct. The history was not at all suggestive of stones in the common bile duct, so it was not opened and explored. One tie was placed on the cystic artery. I was fearful of trying to tie the cystic duct because I could not isolate it well on account of the inflammatory tissue. It was in such close proximity to the common duct that I sutured the open end of the cystic duct over and did not place a ligature around it. I was entirely unable to explain why this man continued to run a biliary fistula. Dr. Mallory, I think you can help us to explain the persistent fistula.

Dr. Tracy B. Mallory: Was an exploration attempted at the second operation, when he had the jejunostomy?

Dr. Linton: Dr. White did that. He took the first loop of the jejunum that appeared and did not explore.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Persistent biliary fistula following cholecystectomy.
Jaundice (obstructive).
Hepatic insufficiency.

ANATOMIC DIAGNOSES

Carcinoma (?) of the pancreas involving the stomach and the common bile duct.
Chronic pancreatitis.
Icterus.
Pulmonary atelectasis.

PATHOLOGIC DISCUSSION

DR. MALLORY: At autopsy we found a large tumor which involved all the retroperitoneal glands, but particularly the glands in the upper half of the abdomen and in the gastrohepatic ligament. The lesser curvature of the stomach showed a large tumor, but it was entirely outside the gastric wall, that is, in the serosa. The mucosa was definitely not involved. The larger portion of the head of the pancreas was all tied up in the tumor mass, evidently invaded by it.

We thought at the time of autopsy that we were probably dealing with a primary carcinoma of the pancreas. The histologic examination has added, I should say, nothing to the certainty of that, possibly detracted a little from it. The tumor was an extraordinarily rapid-growing, undifferentiated one. There were a great many tumor giant cells. It could be either a very rapidly growing, undifferentiated carcinoma or it could be a lymphoblastoma. There were no metastases to the liver. The spleen was uninvolved. The lungs were essentially negative.

A strong argument for primary carcinoma of the pancreas was the finding of marked chronic pancreatitis, of years' duration in all probability, in the remaining portion of the pancreas.

DR. GEORGE W. HOLMES: Did it extend into the mucosa of the stomach?

DR. MALLORY: No, that was entirely uninvolved.

A PHYSICIAN: What did his chest show at autopsy?

DR. MALLORY: The fluid has been almost completely removed. Only about 250 cubic centimeters was left, about the same amount on each side. The right lower lobe was collapsed. The rest of the lungs was negative.

A PHYSICIAN: There was no pleural metastasis?

DR. MALLORY: No.

A PHYSICIAN: No involvement of the mediastinum?

DR. MALLORY: No. The jaundice was evidently due to the pressure of the tumor surrounding the common bile duct. The bile duct was not infiltrated at any point by the tumor.

A PHYSICIAN: Was there anything suggestive in the differential count before the first operation?

DR. DWIGHT: There were 83 per cent polymorphonuclears, 10 per cent lymphocytes, 4 per cent mononuclears and 3 per cent myelocytes.

DR. MALLORY: I do not believe that there is any doubt that he had carcinoma at the time of the first operation. Naturally with an acute cholecystitis one could not go far in exploration.

A PHYSICIAN: Could you trace this whole story as being secondary to gall stones?

DR. MALLORY: It sounds like a very logical course.

A PHYSICIAN: It is a new one, isn't it?

DR. MALLORY: No, I think I have seen it before.

A PHYSICIAN: Was there any evidence of diabetes at that time?

DR. MALLORY: There was no suggestion of it at all.

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CAN VITAMINS BE ABUSED?

THERE is food for thought in the extraordinary hold the vitamin fad has on the average mind. "Vitamins are necessary to maintain health." "Vitamins in food are absolutely essential." Views of this sort are today very popular. The commercial world has not escaped the infection. Quite the reverse; the commercial world is like a sensitive barometer that appreciates keenly and quickly the presence of a wave of popularity that is sweeping over the earth. It not only registers that popularity but it takes advantage of it to its own profit.

As a matter of fact the discovery of vitamins was a most notable achievement, and in the few years since their discovery the knowledge of their existence has been and will continue to be a great boon to humanity.

The coining of the word by Casimir Funk in 1912 was an exceedingly clever performance, but who today has ever seen a vitamin?—who knows what vitamins are? Are they forces or are they matter? Are they imponderables or are they unrecognized chemical elements or combinations?

Curious beyond compare, is it, that vitamins have been, must have been in foods since before man came upon this planet, and yet it is only a little more than a dozen years ago that the world was informed by unimpeachable scientific authorities that vitamins actually were necessary accessory food factors; that their absence from foods was a calamity; that there were in fact, several vitamins the deprivation of which was surely followed by serious consequences to health.

People do not seem to realize that Man did not put vitamins into food stuffs originally. A kind and beneficent, and one might even say a wise Nature put them there and kept them there in just the correct proportions for thousands of years, for Man to destroy, and discover, and utilize in this twentieth century.

A really vitally serious question comes up for consideration, namely, "Is it possible to run this idea of vitamins into the ground?"—or otherwise, "Is it possible to use more of any vitamin than is salutary?"—or again, "Can the overuse of vitamins do harm?" or finally, "Is it possible to overuse vitamins?"

People who are considered sane feel that the quantity of vitamins put into a food by experienced nature, is just enough for the purpose, for nature knows! Man knows today that a deficiency of vitamins causes trouble in the animal economy. No need here to offer experimental evidence to substantiate this statement, though much might be furnished. Man may reason that if a deficiency is capable of causing trouble, an excess also is likely to produce perhaps a different kind of trouble, but trouble of some sort. In other things nature says that exactly the correct proportion will keep health blooming; a deficiency causes an abnormal state; an excess, as a rule, causes a departure from the normal. Thyroid and other endocrine studies come to mind wherein a deficiency on one hand and an excess on the other produce opposite results.

Here is a research worthy of some of our more talented minds.

The idea then, that vitamins can be abused is apropos, and permits a challenge to the proposition recently made in an advertisement of a certain bread that two slices with each meal would give the additional Vitamin D needed and yet one hundred times that quantity at each meal would not give too much.

This seems to be a case of enthusiasm carrying one too far. Is it right to have such teaching influence the lay or professional mind? Think it over. The idea may be worthy of thought.

Surprisingly enough this propaganda has the backing of one of the foremost medical schools of the continent. The conservative elements of the medical profession have so far looked with

disapproval on the commercialization of the medical sciences. Let us hope that we have not yet reached the point where we can view with complacence even a suspicion of venality.

THE BOSTON MENTAL HYGIENE SURVEY

EVERY field of endeavor needs occasionally to take an account of stock, and with this object in mind the Boston Council of Social Agencies and the Boston Health League, representing practically all of the more important social welfare and health agencies of the city advised the Executive Committee of the Massachusetts Society for Mental Hygiene over a year ago that the time was ripe for a survey of the mental hygiene facilities and resources in Boston. In September, 1929, the Commonwealth Fund granted the sum of $5,000 for this purpose, and later the Permanent Charity Fund added to it the sum of $1,800.

The Survey was put under the direction of a committee composed of representatives from the Boston Council of Social Agencies, the Boston Health League, the Massachusetts Department of Mental Diseases, and the Massachusetts Society for Mental Hygiene, and this committee was fortunate in obtaining the services of Dr. George H. Preston, Commissioner of Mental Hygiene of Maryland, as director. Dr. Preston's temporary release from his duties in Maryland began on February 26, 1930, and his final report embodied in a booklet of 180 pages, was made at the joint annual meeting of the Boston Council of Social Agencies, the Boston Health League and the Massachusetts Society for Mental Hygiene on February 27, 1931.

As Dr. Henry B. Elkind, chairman of the Administrative Committee, points out in his introduction to the report, this Survey is unique in many ways: First, it is a survey made under the auspices of the representative social and health agencies of the City, whether they are primarily interested in mental hygiene work or not. Secondly, it is a survey made largely from the point of view of social and health agencies rather than from that of the clinic and clinic staff. Thirdly it has been made largely at a functional and qualitative level rather than at a quantitative level, although some attention has been paid to securing statistical material and to its interpretation.

The methods employed included the usual collection of information by means of interviews, questionnaires, schedules, catalogues and observation, and in addition the study of many records in social agencies and clinics.

The most important recommendations are 14 in number:

1. Increase in the amount of mental hygiene training given Normal School Students in Boston.

2. The development of an organized service for emotionally unadjusted and delinquent children in the public schools, preferably by the establishment of a corps of full-time, thoroughly trained visiting teachers.

3. Continuous training in mental hygiene for the School Nurses.

4. Mental hygiene training for the Nursing Service of the Boston Health Department.

5. Increase in the amount of mental hygiene taught in the Colleges and Professional Schools.

6. The establishment of a strong department of Psychiatric Social Work at Simmons College School of Social Work.

7. The addition of psychiatric social work consultants to the staffs of the larger social agencies.

8. Regular psychiatric social work institutes for case supervisors in the smaller social agencies.

9. Distinction between psychiatric and neurological services and between psychiatric diagnosis and psychiatric treatment services in the Clinics.

10. The development of intensive psychiatric treatment in some of the Clinics.

11. Reorganization of the Juvenile Court Sessions so as to make appropriate psychiatric study available for all juvenile offenders.

12. The execution of some plan which will make psychiatric services available for the use of the ministers of Boston.

13. Increase in the psychiatric service for students in Boston.

14. Constant, close contact between the Massachusetts Society for Mental Hygiene and all mental hygiene teaching in Boston, so that new methods may be made generally available and new material may be added.

Important for a continuation program is the suggestion that the development of Boston's mental hygiene program be placed upon a definite and permanent group—most advantageously a committee of the Council of Social Agencies and the Boston Health League.

The results of this Survey should be of great value from a technical standpoint. It shows us where we are in relation to our present facilities and makes suggestions for future improvements. It does more than this, however. It tends to remove preventive psychiatry from the monopolistic administration of a highly technical group and make it a more general responsibility. We must have our high-powered specialists in all fields, but the public will be better served when an intelligent comprehension of its problems has been more widely acquired.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

LEE, HAROLD G. B.S., M.D. Yale University School of Medicine 1922. Orthopaedic Surgeon, Carney Hospital; St. Luke's Hospital, New Bedford; Central Maine General Hospital, Lewiston, Maine; Peterborough Hospital, Peterborough, N. H., and Elliott Community Hospital, Keene, N. H. His subject is: "Fractures of the Tuberosities of the Tibia." Page 583. Address: 412 Beacon Street, Boston.

SPRAGUE, HOWARD B. A.B., M.D. Harvard University Medical School, 1922. Assistant Physician, Massachusetts General Hospital. Assistant in Medicine, Harvard Medical School (Courses for Graduates). Visiting Physician, House of the Good Samaritan. His subject is: "Auscultation and Heart Sounds." Page 595. Address: 270 Commonwealth Avenue, Boston.

REID, WILLIAM D. A.B., M.D. Harvard University Medical School 1909. F.A.C.P. Assistant Professor of Cardiology, Boston University School of Medicine. Visiting Physician, Massachusetts Memorial Hospitals. Associate Member, Evans Memorial Hospital. Cardiac Consultant to the Newton Hospital and the Waltham Hospital. His subjects are: "Heart Murmurs in the Practice of Medicine," Page 597, and "Progress in Medical Education," Page 609. Address: 510 Commonwealth Avenue, Boston.

MCCRUDDEN, FRANCIS H. S.B., M.D. Harvard University Medical School 1908. Assistant Medical Director, New England Mutual Life Insurance Co., Boston, Mass. His subject is: "Heart Murmurs and Insurance." Page 598. Address: 95 Milk Street, Boston.

WEISS, SOMA. A.B., M.D. Cornell University Medical College 1923. Assistant Professor of Medicine, Harvard Medical School. Associate Physician, Thorndike Memorial Laboratory, Boston City Hospital. His subject is: "The Normal Arterial Blood Pressure and Its Measurement." Page 600. Address: Boston City Hospital, Boston.

PALMER, ROBERT STERLING. A.B., M.D. Harvard University Medical School 1925. Assistant in Medicine, Massachusetts General Hospital and Harvard Medical School. His subject is: "Abnormal Blood Pressure." Page 602. Address: 264 Beacon Street, Boston.

O'HARE, JAMES P. A.B., M.D. Harvard University Medical School 1911. Assistant Professor of Medicine, Harvard Medical School. Senior Associate in Medicine, Peter Bent Brigham Hospital. His subject is: "Treatment of Hypertension." Page 602. Address: 520 Commonwealth Avenue, Boston.

DAVIS, MICHAEL M. A.B., Ph.D., Columbia, 1906. Director of Boston Dispensary 1910-1920. Executive Secretary, Committee on Dispensary Development of the United Hospital Fund of New York 1920-1927. Executive Secretary, Associated Out-Patients Clinics of the City of New York, 1921-1927. Director for Medical Services, Julius Rosenwald Fund, Chicago, 1929-. His subject is: "What the Public Has a Right to Expect of Clinics." Page 604. Address: Julius Rosenwald Fund, 900 South Homan Avenue, Chicago, Illinois.

HEINZ, HERSCHEL. B.S., M.D. Harvard University Medical School 1925. Assistant Visiting Obstetrician, St. Luke's Hospital, New Bedford, Mass. His subject is: "A Vaginal Speculum for Use in Children." Page 607. Address: 7 North Orchard Street, New Bedford, Mass.

The Massachusetts Medical Society

REPORT OF THE DELEGATES TO THE ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE AND HOSPITALS

THE Twenty-seventh Annual Congress on Medical Education, Medical Licensure and Hospitals was held at Chicago February 16, 17 and 18 under the auspices of the American Medical Association. Participating in the Congress were the Council on Medical Education and Hospitals of the American Medical Association, the Federation of State Medical Boards of the United States, and the American Conference on Hospital Service.

The Central Council for Nursing Education held an institute for lay boards of hospitals and public health nursing organizations on February 17. At the Annual Banquet for the above-mentioned organizations, Dr. Henry A. Christian of Boston read a paper on "The Clinic as a Center of Graduate Study."

Much space was given to the care of the mentally sick in the United States and Dr. Ray Lyman Wilbur, Secretary of the Interior, opened the session with a paper entitled "Mental Health as a National Problem." He spoke of the present cost of the segregated care of the insane as being enormous and evidently growing. He suggested the best approach to a mentally disturbed individual as coming from a physician rather than that of an officer of the law, who would naturally favor a jail in preference to a hospital for the care of such a person. He suggested a united effort to care for mental cases along the very best medical and hospital lines and the careful study of all criminals before judgment is passed upon them.

Papers were read by competent authorities upon the present matter of caring for the men-

tally ill in federal, state and private institutions. One reader discussed the present mayoralty campaign in Chicago as being indicative not only of the fact that all the candidates were abnormal personalities but that the citizens were likewise in permitting such men to represent them.

Dr. Walter L. Treadway, Assistant Surgeon General, explained the manner in which the Federal Government is handling the problem of caring for the mentally ill.

Stations have been established in sixteen foreign countries to better observe applicants for admission to the United States. Seven out of every thousand are found to be mentally unfit and are denied entrance. This percentage is dependable and was used as a basis in 1918 for the estimate of the probable number of insane veterans to be provided for at the end of ten years. Time showed that there were 58,000 mentally ill and the method of computation was found to be correct.

One of the most interesting papers was presented by Dr. Charles P. Emerson, Dean of the Indiana University School of Medicine, who spoke on the "Present Trend of Medical Education." He compared the type of medicine taught during any given period as indicative of the intellectual standing of that particular time. For instance, he said that the same period that produced Hippocrates also gave us Socrates. At the time of Galen we had the Roman Law. At Sydenham's time Shakespeare existed. In the present machine and electrical era we find members of our profession resorting to instruments to do their work and the physician is thus losing his personality in treating cases rather than patients. He said that every surgical operation is an acknowledgment of a medical defeat and that statistics show that eighty per cent. of patients suffering with neuroses eventually become surgical patients. He deplored the fact that young physicians too often cease studying the moment they receive their diplomas when he said "In swimming the stream of medical thought, we find many who swam financially and drowned intellectually." In closing he favored the ideal practice as one in a public hospital where research and laboratory work could be done for the private physician as well as those favored by an appointment on the staff, for the good of the general public. The needs of a private patient could thus be met and countless lives saved, as well as general practitioners developed in the progress in medical thought.

Dr. Wilburt C. Davison, Dean of the Duke University School of Medicine, favored the broadening of present entrance requirements and spoke of a student who now leads his class at the end of the third year and who never had any premedical instruction in physics, chemistry or biology. This particular student was admitted as an "experiment" and was quoted as an "object lesson". Dr. Davison favored the four quarter term as being desirable in many ways.

Dr. William J. Mayo of the Mayo Clinic, Rochester, Minnesota, said that medical education was in a state of flux and that while culture is the keystone of a premedical education it can be overdone. He thought that memory tests should be succeeded by opportunities to develop natural ability and observation. He thought too much time was spent in preparing for a medical school and that the student's mind was often dulled when it should be in its most receptive state. He favored the four quarter method of instruction continuing right through the course, that the student may receive his diploma in three full years and then have opportunity for the more important work of an intern and later instruction in a specialty if so desired. He said that the educator and teacher of the cultural subjects looks to the past while the wise man looks to the future. He strongly favored the revision of requirements. He quoted an old Persian proverb as being applicable—"He who knows and doesn't know he knows is he who plows and plows and never sows." He strongly favored the student being brought into actual contact with patients early in the first year and continued throughout the medical course. He thought that the average student, while overfed in the cultural and exacting sciences, was given no opportunity to study the present social fabric and was thus lacking in comprehension of human contacts while crammed full of useless theories.

The "Continuous Session Plan" and the "Preceptor System Plan" were well presented by their readers and thoroughly discussed.

Seventeen Class A medical schools in this country have adopted the four quarter method and thus graduate their students in three school years. None of the deans of these colleges has ever regretted this method and each year more schools are adopting this principle.

Dr. Willard C. Rappleye, the newly appointed Dean of Columbia University College of Physicians and Surgeons, described the methods of examining students in Europe and said that all applicants who are duly qualified are accepted. He spoke of one school having twenty-five hundred students. It is estimated that at least eight hundred American students, many from Class C schools, are taking courses in European medical schools and plan to return to this country to practice.

The state medical boards had several papers touching on registration and licensure which were most interesting and they did not favor the licensing of individuals as specialists. One state board examiner spoke of calling on a physician who admitted that he was an internist and finding the reception room quite filled with patients the visitor remarked that it was a very busy day. The internist said "Yes, today is Thursday and *this is the day* upon which I give

my patients insulin." After much debate it was decided that the state boards should continue to determine the ability of the applicant to be registered even if he were a graduate of a Class A school.

Hon. Sol. Ullman, Deputy Attorney-General of New York, advised that a definition of medicine be placed in every state medical practice act, as otherwise an attorney might have difficulty in obtaining convictions.

Another attorney, Thomas V. McDavitt, of the Bureau of Legal Medicine and Legislation of the American Medical Association, said that private hospitals had the right to bar cultists but federal and municipal ones could not always do that if the cultists were recognized in that particular state. Twenty-one states now have annual registration. While the principle was favored by almost all the delegates, many felt that it was unconstitutional to tax the medical practitioners a stated sum, when the funds go directly to the treasury of each state and are not applied for the purpose for which the money was raised.

The teaching of pediatrics, the supervision of convalescent care, the training of interns and the problems of State Boards of Registration were given much time and discussion.

The papers were well read by recognized authorities and discussed intelligently by delegates from different states. Honest differences of opinion, due to experiences obtained under different conditions, made the debate interesting and very instructive.

HORACE P. STEVENS.
THOMAS J. O'BRIEN.

THE BOSTON MEDICAL LIBRARY

LAENNEC

1781-1826

FROM how trifling a circumstance a great discovery is often derived! When one looks back over his own efforts to become acquainted with the significance of the sounds that mark the presence in the thorax of pathologic conditions, it is interesting to recall that the means by which these phenomena were made clear was due to a very simple observation by Théophile Laennec.

While he was one day watching some children at play he noticed that it was possible to hear the scratch of a pin transmitted the length of a wooden beam, when the ear was applied at the opposite end. Acting upon this observation he rolled a sheet of paper tightly and when one end was resting over the precordium he was enabled to hear the heart sounds with far greater distinctness than he had ever been able to hear them with the ear laid against the chest wall. The power of steam and the possibility of harnessing it for man's work was recognized as a result of an equally trifling observation upon a teakettle in which water was being boiled. What has come out of that observation is a matter of common knowledge. Outside the medical profession the importance of the method of mediate auscultation is scarcely appreciated. The value of this discovery would have served to make the Laennec name famous, though he never had done anything else.

Théophile Laennec was born on the 17th of February, 1781 in the town of Quimper, in the province of Brittany, France. The influence of physical environment upon individual character is difficult to prove but instances of its apparent effect are common enough to lead one to believe that something more than imagination underlies this feeling. Where the spark of genius resides, the possibility of bringing this out through environmental influences is certainly greatly augmented. It is easy to believe that in the case of Laennec the surroundings in which he found himself in the romantic setting of Brittany were a factor which cannot be overlooked in arriving at an understanding of the man's character. The stock from which he descended was distinguished on both sides. The Laennecs were an old family in Breton, dating back as far as 1445.

Vincent Laennec, from whom Théophile was in direct line, was a Notary in 1573 and it is recorded of him that he was of distinguished literary ability. Théophile's father seems to have been a man of small consequence, negligent of his paternal responsibilities and in general a "ne'er-do-weel". His mother was from an intellectual family and was a grandniece of one of the most distinguished historians of France. She died of tuberculosis when her son was quite young. His father married a second time and Théophile went to stay with an uncle in Nantes in 1795. This uncle was a physician and it was through him that Laennec was induced to enter upon the study of medicine, and by him his course was planned. When he was not yet 15 he began the study of medicine at the School of Medicine at the Hôtel Dieu in Nantes. His studies were interrupted by the necessity of military service, he being sent, as an officer de Santé, with troops which suppressed a royalist insurrection near Quimper.

Théophile returned to his studies in Nantes and later went up to Paris to complete them at the Ecôle de Médicine, in 1801. Here he distinguished himself as a student, and early began to attract attention through his writings. These drew the fire of such big guns as Dupuytren and Broussais who opposed his ideas, but he had the satisfaction of being able to defend the positions he had taken because of the accuracy of his observations in the clinic and postmortem room. He was one of the first, if not the first, internist to check his clinical observations against the findings of the postmortem table. While at the Charité under Corvisart, he made complete studies on 400 patients in 3

years. He was enabled to do this because he made his notes in shorthand. He also at this time mastered the Greek language so that he might read Hippocrates in the original. In 1803 he won the Grand Prize in both Medicine and Surgery. The theses he wrote to secure this prize were dedicated to his physician-uncle, who had borne the expense of their publication. In 1816 he was appointed to the Nekker Hospital and in 1823 transferred to the Charité where in the following year he became the successor to Corvisart as full Professor at the Medical College of France. In 1824 he was made a Chevalier of the Legion of Honor and was appointed to be the physician of the Duchess du Berry. He had been obliged, on account of ill health, to give up his work in 1818 and it would seem as though it were the irony of fate that would single out the one whose contribution to the study of tuberculosis had been as conspicuous as had Laennec's to fall a victim to that disease. He retired to his ancestral home in Brittany where he lived an out-of-door life, doing only a little consulting work with the local physicians. After a time his health improved and he returned to his duties in Paris. In 1824 he married but only two years remained to him of the allotted span of life and in the spring of 1826 he again gave up his work and went back to the country, where he lingered until the 13th of August 1826 when he died. He was buried near the parish church overlooking the sea which had always had such a fascination for him.

Corvisart, an ardent follower of Hippocrates, who was his teacher, impressed upon him the importance of dealing with observed facts and this was the guiding principle of his whole career. He was a clear thinker and wrote in a convincing style. He was the first to describe accurately the sub-acromial bursa and one of his earliest papers was upon peritonitis, about which there was no knowledge at that time. This remains a classic to this day. His interest in pathological anatomy furnished him the subjects for many of his contributions to medical literature. He made several notable additions to the knowledge of normal anatomy particularly with reference to the fibrous capsule that covers the liver, spleen and kidneys. In parasitology he became interested as a student and for several years communications came from his pen describing accurately what he observed of the life history of the vesicular worms. He was an early contributor to our knowledge of pathological anatomy and, though his classification is now out of date, it marked the beginnings of systematized information along this line. He also studied the cirrhoses of the liver and made several valuable observations concerning them. In 1819 his work on Mediate Auscultation appeared and so much in demand was it that between 1819 and 1839 there were 19 separate printings, in English, Italian, German, Belgian and French. He began to study medicine when he was 14, was writing articles that attracted attention and would have engaged him in polemical discussions with prominent clinicians in his own country had he been willing to be drawn into them. He was teaching and carrying on many anatomical, pathological and clinical investigations by the time he was 28-30, lost quite a little time on account of poor health, contributed extensively to periodical medical literature, published book reviews and books of which he was author, and died at 45, with a record of accomplishment which might well give anyone the feeling that life had not been lived in vain.

MASSACHUSETTS LEGISLATIVE NOTE

DR. WOODWARD'S VACCINATION BILL KILLED IN THE SENATE

Much to the surprise of the physicians who attended the hearing on Dr. Woodward's vaccination bill which was designed to place pupils in private schools on the same basis with respect to vaccination as is now required of public school scholars, the Senate killed the bill without debate after it had passed the House.

The arguments submitted at the hearing before the Committee on Public Health supported from all angles by many of our wisest physicians evidently found unwilling minds in the Senate. The inference is that a majority agreement had been reached to kill the bill which had the effect of preventing discussion. Did any of the members wish to avoid telling the world where they stood?

From our standpoint we wonder whether the House is composed of more intelligent men than the Senate or whether the senators are more susceptible to adverse arguments or again whether the shadow of the opposing opinion of a former governor clouds the mental vision of some of our senators.

We probably will never know exactly the why and wherefore of this decision but this we do know that our Senate is not responsive to argument based on fact or to the united opinion of the medical profession on this important health measure.

It does not fully appreciate the economic importance of smallpox or the terrible suffering visited on its victims.

Physicians view this unreasoning opposition to a wise health measure without personal concern because the prevention of this disease is available to all, but they do feel concern for the helpless child who may be permitted to become a victim of the disease because of the disinclination of law-makers to give it practically perfect protection.

Some very wise persons have felt that an occasional widespread visitation of smallpox is the only way to convince the opponents of this health measure. Small wonder that public-spirited citizens sometimes grow weary in trying to serve humanity.

We hope that Dr. Woodward will gird his loins and again go forth to battle.

MISCELLANY

UNETHICAL WHISKEY PRESCRIPTIONS

The government has been somewhat lenient in not carrying on an aggressive campaign against doctors who are willing to provide prescriptions for whiskey where it is not needed for illness.

Although, when there are obvious reasons to suspect doctors of this custom, prosecutions have followed, the government is now adopting a more vigorous policy as shown by the arrest of 396 doctors in New York recently who had sold prescriptions for one dollar each.

Anyone who breaks the law is liable to prosecution and a careful examination of druggists' files will probably uncover any existing irregularities.

Suspicion exists that some doctors have accommodated applicants for prescriptions where alcoholic beverages have not been strictly indicated and prosecution is an unpleasant predicament to meet.

Sympathy and an obliging disposition will not be a valid defense before the court.

PHYSICIANS SENTENCED

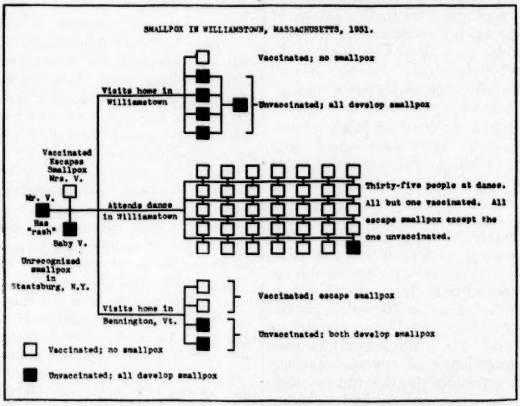
Dr. Edward J. Flaherty, town physician of Maynard, and Dr. Irving F. Armstrong of Hudson, have been convicted for complicity in automobile insurance frauds in Middlesex County, and have been given jail sentences and fines by Judge John M. Gibbs in the Middlesex Superior Criminal court.

Dr. Flaherty was sentenced to nine months in the house of correction and fined $250 and Dr. Armstrong to 15 months in the house of correction and $500 fine. An appeal will be made to the Supreme Court.

Judge Gibbs severely condemned the physicians for prostituting for a few dollars one of the noblest of professions, declaring that the conspiracy to mulct insurance companies by fake cases could not have amounted to anything without the aid of doctors.

THE 1931 INCIDENCE OF SMALLPOX IN WILLIAMSTOWN

This chart illustrating in graphic form the incidence of smallpox in Williamstown, Massachusetts, in 1931 was made by Professor M. J. Rosenau and exhibited to the Legislative Committee on Public Health of Massachusetts at the recent hearing on the bill to extend the provision of the present law requiring compulsory vaccination of public school children to include pupils in private schools.


SMALLPOX IN WILLIAMSTOWN, MASSACHUSETTS, 1931.
Vaccinated; no smallpox
Visits home in Williamstown
Unvaccinated; all develop smallpox
Vaccinated Escapes Smallpox Mrs. V.
Mr. V.
Has "rash"
Baby V.
Attends dance in Williamstown
Thirty-five people at dance. All but one vaccinated. All escape smallpox except the one unvaccinated.
Unrecognized smallpox in Staatsburg, N.Y.
Visits home in Bennington, Vt.
Vaccinated; escape smallpox
Unvaccinated; both develop smallpox
Vaccinated; no smallpox
Unvaccinated; all develop smallpox

DOMICILIARY MEDICAL SERVICE IN BOSTON

The Boston Health League has asked us to publish the following information:

In an earlier issue of the *New England Journal of Medicine* (June 5, 1930) there was an editorial describing the needs for an extension throughout all parts of Boston of the free domiciliary medical service to the poor, which already existed at that time in the older districts of the city.

Through the efforts of a committee of the Boston Health League such an extension of service has been made possible for the current year. There is an especial value to this service in the present period of economic depression, when many families, ordinarily able to meet their medical fees, are out of work and therefore without financial resources to cover the costs of sickness.

Believing that physicians, nurses, social workers and others should be more widely informed of the fact that throughout the entire city of Boston free medical service in their own homes is now available to sick poor people, we are herewith printing the names of the agencies furnishing such service, the conditions under which it is extended, and the method of referring such cases.

Since each agency has its own geographic district and to a certain extent its own conditions of eligibility this information is presented in the form of a table.

FREE DOMICILIARY MEDICAL SERVICE IN BOSTON

Agency Giving Service	District Served	Cases Eligible	Method of Referring Cases
Boston Dispensary 25 Bennet Street	Allston, Brighton, Charlestown, East Boston, Mattapan, Hyde Park, South Boston, Dorchester (south of Dudley Street), North End, Back Bay and part of Roxbury with the following streets as boundaries: Washington Street, from Boston Harbor to Winter; Winter Street, Tremont Street to Roxbury Crossing; Columbus Avenue; Heath Street and South Huntington Avenue to Brookline line.	Persons too sick to travel to a clinic, and unable to pay for a private physician. This service is not intended to meet emergencies, to provide obstetrical care, or to treat new cases on Sundays or holidays. Nurses of the Community Health Association visit all patients seen by the physician.	Telephone Hancock 5650 Between 8.45 A. M. and 5 P. M. Ask for District Executive's Office. At other hours ask for Superintendent of Boston Dispensary Hospital for Children or Refer cases needing medical service to local stations of Community Health Association.
Jamaica Plain Dispensary 25 South Street	Forest Hills, Jamaica Plain, Roslindale and West Roxbury with the following streets as boundaries: South Huntington Avenue and Heath Street from Brookline line to Columbus Avenue; Columbus Avenue; Seaver Street; Blue Hill Avenue; Canterbury Street; former Hyde Park town line to Dedham.	All medical and minor surgical cases in families unable to employ a physician. Maternity cases referred to hospital.	Telephone Jamaica 0272 or Refer cases to Community Health Association, Curtis Hall, Jamaica Plain.
Massachusetts Memorial Hospitals 750 Harrison Avenue	Obstetrical cases cared for in any part of Boston. Medical cases in South End and part of Roxbury within the following streets as boundaries: Winter Street; Tremont Street to Roxbury Crossing; Dudley Street, Magazine Street; Massachusetts Avenue; Albany Street, Beach Street, Atlantic Avenue; Summer Street and Winter Street.	Families unable to meet fees of private physicians.	Telephone Kenmore 9200 Between 9 A. M. and 5 P. M. Ask for Out-Patient Department, Admitting Officer or Supervisor. Between 5 P. M. and 9 A. M. ask for Robinson Memorial office Admitting Officer.
Medical Mission Dispensary 36 Hull Street	North End bounded by water front, Summer Street, and Washington Street.	Families unable to meet expenses of private physician. Families referred by Overseers of Public Welfare; any member of Boston Council of Social Agencies; any minister or priest; public schools. Only emergency calls should be made during the night.	Telephone Richmond 1386 or 1387. Between 9 A. M. and 5 P. M. ask for Admitting Officer. Between 5 P. M. and 9 A. M. ask for nurse on duty.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS

JANUARY, 1931

The total number of cases of infectious diseases reported for the month of January, 1931, namely, 10,687, is not unduly high.

Diphtheria shows the low figure of 337 cases, over 50 cases less than the lowest recorded figure in 26 years for January.

Mumps, German measles, measles and scarlet fever are reported at about their usual figure for the month, as are whooping cough, chicken-pox and lobar pneumonia.

Typhoid fever was reported 16 times in January, which is very definitely low for the month.

Nine cases of anterior poliomyelitis were reported, which is somewhat more than the usual figure for January.

Tuberculosis shows no unusual tendencies.

Cerebrospinal meningitis, reported ten times, is approximately the normal figure for the month.

The figures for syphilis and gonorrhea continue to reflect the better spirit with which the diseases are being reported.

Influenza was reported 458 times in January, the largest number of cases reported for the month since 1920 with the single exception of the year 1929, when nearly 8000 cases were reported.

RARE DISEASES

Anterior Poliomyelitis was reported from Boston, 2; Brockton, 1; Lawrence, 1; Plymouth, 1; Waltham, 1; Webster, 1; Worcester, 2; total, 9.

Dysentery was reported from Boston, 1; Everett, 1; total, 2.

Encephalitis lethargica was reported from Boston, 2; Cambridge, 1; Colerain, 1; Lynn, 1; North Andover, 1; Northampton, 1; Swampscott, 1; Worcester, 1; total, 9.

Epidemic cerebrospinal meningitis was reported from Belchertown, 1; Boston, 2; Lawrence, 1; Medford, 3; Somerville, 1; Wakefield, 1; Waltham, 1; total, 10.

Septic sore throat was reported from Belmont, 1; Boston, 7; Cambridge, 1; Fall River, 1; Fitchburg, 1; Malden, 2; Medford, 1; North Andover, 1; Northampton, 7; Pittsfield, 1; Quincy, 1; Stoneham, 1; Taunton, 1; total, 26.

Smallpox was reported from Williamstown, 6.

Tetanus was reported from Boston, 1.

Trachoma was reported from Arlington, 1; Boston, 3; total, 4.

Undulant fever was reported from Mansfield, 1; Oak Bluffs, 1; total, 2.

MONTHLY REPORT OF CERTAIN COMMUNICABLE DISEASES

	Cases in Entire Pop.				Case Rates per 100,000 Pop.		
	Jan. 1931	Jan. 1930	Proso. Index*	Epi. Index†	Jan. 1931	Jan. 1930	Expected Rates‡
All Causes	10,682	10,476	—	—	249.8	246.2	—
Ant. Polio.	9	4	15	.6	.2	.1	.4
Diphtheria	337	562	444	.8	7.9	13.2	10.4
Ep. C. S. Men.	10	20	12	.8	.2	.5	.3
Measles	2483	1153	2859	.9	58.1	27.1	66.9
Pneu. Lobar	641	589	587	1.1	15.0	13.8	13.7
Scarlet Fever	1409	1496	1198	1.1	33.0	35.2	28.0
Tuberculosis, Pul.	395	408	356	1.1	9.2	9.6	8.3
Typhoid Fever	16	25	15	1.1	.4	.6	.4
Whooping Cough	806	1710	1164	.7	18.8	40.2	61.7
Chicken-pox	1896	1697	—	—	44.3	39.9	—
German Measles	143	85	—	—	3.3	2.0	—
Gonorrhea	632	588	—	—	14.8	13.8	—
Influenza	458	49	—	—	10.7	1.2	—
Mumps	453	1005	—	—	10.6	23.6	—
Syphilis	335	390	—	—	7.8	9.2	—
Tuberculosis, O. Forms	52	57	—	—	1.2	1.3	—

*This index is an attempt to estimate the number of cases based on the trend during the past years which can be expected to occur, and is for the purpose of comparison with the number of cases which actually did occur.

†This ratio expresses how prevalent the disease is compared with the index mentioned above; 1.0 indicates that the actual number of cases equals the expected number. A larger number means a greater prevalence, and a smaller number a lesser prevalence than expected. Thus, 2.0 would indicate twice the expected number of cases, and .5 half the expected number of cases. The method used to determine the indices is described in the August 18, 1927 issue of the *Boston Medical and Surgical Journal*.

‡Calculated from the Prosodemic Index.

RECENT DEATHS

BARDWELL—DR. FREDERICK ALBERT BARDWELL, a non-resident Fellow of the Massachusetts Medical Society, a graduate of the New York Homeopathic Medical College and Hospital in 1893 and of Harvard Medical School in 1901, has died at the United States Veterans Hospital, No. 60, at Oteen, North Carolina. His death occurred from coronary thrombosis on February 15, 1931. He was 66 years old.

CHAPMAN—News has been received of the death in Longmeadow of DR. CHARLES RATCHFORD CHAPMAN following an illness of nine weeks, on March 2, 1931, aged 59.

A native of Richmond, Indiana, his parents took him to Minneapolis in his early childhood. There he had his education in the public schools. Going to Philadelphia he took his M.D. from Jefferson Medical College in 1892 and then studied diseases of the eye, ear, nose and throat abroad. Returning he began practice in Lowell but soon moved to Springfield where he had practiced since devoting himself to his specialty.

Dr. Chapman was a member of the American College of Surgeons, of the Massachusetts Medical So-

ciety, and of the American Medical Association, also of the Springfield Lodge of Masons, of Melba Temple, and Nobles of the Mystic Shrine. He was on the staff of Wesson Memorial Hospital and also was a trustee of that institution.

He is survived by his wife, who was Miss Hazel Sheffield, and by three daughters.

EASTMAN—Dr. Theodore Jewett Eastman, a practitioner of internal medicine in Boston for twenty-three years, died at the Baker Memorial Hospital after a short illness, March 9, 1931, at the age of 51, following two serious operations.

A grandson of Dr. Theodore Herman Jewett, a noted country practitioner of South Berwick, Maine, and lecturer on obstetrics at the Medical School of Maine, he was born in that town, later attending Noble & Greenough's School in Boston. All his life he kept in touch with his aunts, Sarah Orne Jewett, author of "A Country Doctor" and other novels, and the scholarly Miss Mary Jewett, life-long residents of Berwick. Dr. Eastman took his A.B. degree at Harvard in the class of 1901, and went on to Harvard Medical School where the M.D. degree was given him in 1905. He attained the rank of *cum laude* in both college and school. After an interneship at the Massachusetts General Hospital, a year's study in Europe and a summer spent in practice at Isle-au-Haut off the mouth of the Penobscot River, in Maine, Dr. Eastman began general practice in Boston, visiting South Berwick frequently and maintaining a legal residence there. He was interested in antiques, especially in old clocks, and had made trips among the Indians in the regions north of British Columbia. His genial personality brought under his care a large number of patients.

Among his memberships were the American Medical Association, the Massachusetts Medical Society, the Aesculapian Club, Harvard Travelers' Club, Boston Medical Library, Boston Society of Natural History, Maine Historical Society, and the Harvard Club of Boston. Dr. Eastman was unmarried.

KENNEY—Dr. Thomas Francis Kenney, director of public health of Worcester, a member of the standing committee on public health of the Massachusetts Medical Society, died at the Peter Bent Brigham Hospital, Roxbury, March 15, 1931, at the age of 51, after an illness of two months.

The son of Thomas and Anastasia Quinn Kenney he was a native of Worcester where he was graduated from the public schools. A graduate of Harvard Medical School in the spring of 1905 Dr. Kenney went abroad to study public health. On his return he lectured on that subject at the Massachusetts Institute of Technology and after 1919 had been director of public health in Worcester. He was a rotarian and last year was governor of the 31st district of that organization. He had served as president of the American Association of Public Health.

NEWS ITEMS

TWO PHYSICIANS SUSPECTED OF COMPLICITY IN THE INSURANCE FRAUD CASES HAVE BEEN ADJUDGED NOT GUILTY—Doctors J. P. Collins and A. E. Lemarbre have been relieved of suspicion of being implicated in automobile insurance frauds.

TWO AND A HALF MILLIONS TO STANFORD UNIVERSITY FOR A MEDICAL SCHOOL—The report that an anonymous donor has given $2,500,000 to Stanford University has appeared in the public press.

This building will be erected in San Francisco and will replace the present structure. The gift is conditional on the raising of $1,250,000 as an endowment.

NOTICE

MEDICAL CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P. M. on Thursday, March 26, in the Amphitheatre of the Peter Bent Brigham Hospital, a medical clinic will be given by Dr. Henry A. Christian, to which physicians are cordially invited. These clinics will be held regularly on Thursday afternoons.

REPORT AND NOTICES OF MEETINGS

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

The regular meeting of the Essex South District Medical Society was held Wednesday, March 4, 1931, at the Lynn Hospital,

Clinic at 5 P. M. Dinner at 7 P. M.

CLINICAL PROGRAM

1. Congenital Anomaly of Esophagus. (With drawings.) Thomas R. O'Brien, M.D.
2. Congenital Absence of both External Auditory Meati and Auricles. Partial Cleft Palate. Ellis Michelson, M.D.
3. Lymphosarcoma of Tonsil. P. W. Wainshel, M.D.
4. Inflammatory Mass in the Lower Sigmoid. O. C. Blair, M.D.
5. Foreign Body in the Eye. George E. Rafferty, M.D.
6. Interesting Eclampsia. Harold I. Cohen, M.D.
7. Unusual Case of Appendicitis. George H. Kirkpatrick, M.D.
8. Hypertension or Chronic Nephritis? J. Armand Bedard, M.D.

Exhibition of Plates in X-ray Department.

SPEAKERS

Dr. Henry H. Faxon of Boston. Subject: "Treatment of Varicose Veins and Ulcers by the Injection Method."

Dr. Arthur W. Allen of Boston. Subject: "Neuro-Vascular Surgery."

Lantern Slide Demonstrations.

PLYMOUTH DISTRICT MEDICAL SOCIETY

The next regular meeting of the Plymouth District Medical Society will be held at the Moore Hospital, March 24, 1931, at 11 A. M. Program: 1. Report of Cases with Color Photography of Surgical Specimens, Dr. George A. Moore. 2. Modern Diagnostic Methods, Dr. Allan Winter Rowe, Director, Evans Memorial Hospital.

G. A. Moore, M.D., *Secretary.*

BOSTON CITY HOSPITAL CLINICAL MEETING

March 25, 1931
Cheever Amphitheatre
8.15 to 10. P. M.

Dr. Arthur R. Kimpton:

1. Cardiospasm. Demonstration of a Case.
2. Pneumococcus Septicaemia (Type I). Felton's serum.
3. Acute Appendicitis, Peritonitis, Acute Dilatation of the Stomach.
4. Multiple Operations. Use of Amniotic Fluid. Demonstration of a Case.

Dr. E. Everett O'Neil:

1. Thrombophlebitis in Varicose Veins. Demonstration of Cases.
2. Injection Treatment in Hemorrhoids and Pruritus Ani.

Subject of Cases to be demonstrated by Dr. William H. Robey and Dr. W. Richard Ohler to be announced later.

THE BETH ISRAEL HOSPITAL PEDIATRIC CLUB

The next regular meeting of the Pediatric Club will be held in the auditorium of the Beth Israel Hospital on Thursday, March 26, 1931, at 8.15 p. m.

Program: 1, "Asthmatic Bronchitis", Dr. Abraham Colmes; 2, "Allergy" in Eczema, Dr. Sidney H. Weiner.

Ruth Weissman, M.D., *Secretary.*

NEW ENGLAND DERMATOLOGICAL SOCIETY

The annual meeting of the New England Dermatological Society will be held on Wednesday, April 8. There will be a clinical meeting at the Boston City Hospital Skin Out Patient Department at three o'clock and a dinner and entertainment at the University Club at six-thirty P. M.

Rudolph Jacoby, *Secretary,*
New England Dermatological Society.

PROGRAM OF THE THIRD CONGRESS OF THE PAN AMERICAN MEDICAL ASSOCIATION AT THE CITY OF MEXICO

Sunday, July 26

8 P. M. Inaugural Session attended by the Honorable President of the Republic at the "Bolivar Hall" of the National Preparatory School.

Monday, July 27

9 A. M. Practical demonstrations in Medicine and Surgery in several Hospitals and Laboratories.

3 P. M. Sessions of different Sections.

7 P. M. Reception at Chapultepec Castle by the Honorable President of the Republic.

Tuesday, July 28

9 A. M. Practical demonstration in Medicine and Surgery in several Hospitals and Laboratories.

1 P. M. Luncheon under the auspices of the Organization Committee at the National Preparatory School.

3.30 P. M. Sessions of different Sections.

9 P. M. Concert at the Hall of the National Preparatory School.

Wednesday, July 29

9 A. M. Visit to several branches of the Department of Public Health.

1 P. M. Luncheon under the auspices of the Department of Public Education.

3.30 P. M. Sessions of different Sections.

8 P. M. General Session at the National Academy of Medicine in honor of foreign Delegates.

Thursday, July 30

9 A. M. Sessions of different Sections.

10 P. M. Ball offered by the Department of Public Health.

Friday, July 31

10 A. M. Meeting of the Committee on Resolutions.

8 P. M. Final General Session.

A Scientific and Commercial Exposition will take place where the sessions are to be held.

For the convenience of those attending the meeting special excursion rates have been arranged with the steamship lines and by railroad.

From the Atlantic Coast, via New York, by the Ward Line: Rate to Mexico City and return, in first class, including the railroad from Veracruz to Mexico, $150.00 and from Havana $115.00.

Any information can be obtained from: Dr. Francisco de P. Miranda, Executive Secretary of the Congress, Departamento de Salubridad, Mexico City; Dr. Conrad Berens, Treasurer of the Pan American Medical Association, 35 East 70th Street, New York City; Dr. J. E. Lopez Silvero, Executive Secretary of the Association, Secretaria de Sanidad, Havana, Cuba.

AMERICAN PUBLIC HEALTH ASSOCIATION

The American Public Health Association announces its Sixtieth Annual Meeting, September 14-17, in Montreal, Quebec, with the Windsor Hotel as headquarters.

The Association has not held a meeting in Canada since 1908 and public health workers from the Dominion and from the United States are invited to take advantage of this opportunity for closer contact. The program is being planned with the progress and needs of both countries in mind. Such subjects as toxoid immunization; rural sanitation, particularly the organization of a practical program for county health units; health education for a large city, for a small city and for a rural community; camp and resort sanitation, including fungus skin infections, particularly those transmitted in swim-

ming pools, and general sanitation of auto camps, have been considered so important by the Program Committee that special sessions will be devoted to them.

Each Section of the Association will arrange individual programs, covering public health administration, laboratory research, vital statistics, public health engineering, food, drugs and nutrition, child hygiene, public health nursing, health education, epidemiology and industrial hygiene.

Meetings of four other organizations—American Association of School Physicians, Conference of State Sanitary Engineers, International Society of Medical Officers of Health and the International Association of Dairy and Milk Inspectors—will take place during or immediately preceding the sessions of the American Public Health Association in Montreal.

For further information address the American Public Health Association, 450 Seventh Avenue, New York, N. Y.

PROFESSOR HEINRICH WIELAND WILL DELIVER A LECTURE AT THE HARVARD MEDICAL SCHOOL

Professor Heinrich Wieland of Munich, who is this year delivering the Silliman Lectures at Yale, has consented to give a lecture at the Harvard Medical School. The lecture will be given Tuesday, March 24, 1931, at 5 P. M., in Amphitheatre C. Subject: "Recent Researches in Enzymatic Oxidation."

HARVARD MEDICAL SOCIETY

Next meeting in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance), Tuesday evening, March 24, 1931, at 8.15 o'clock.

PROGRAM

Presentation of Cases.

Endothermy, Chameleons, Jungle Temples and Avertin. Arthur J. McLean, Resident Surgeon, Peter Bent Brigham Hospital.

Medical students and physicians are cordially invited to attend.

WM. P. MURPHY, *Secretary.*

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

March 23-30—Lectures on Keeping Mentally Fit. Given under the auspices of the Massachusetts Division of University Extension and the Massachusetts Society for Mental Hygiene. Boston.
Lectures, in the Gardner Auditorium, State House, Boston, Monday evenings.
Course Leader: Dr. Henry B. Elkind, Medical Director, Massachusetts Society for Mental Hygiene.

March 23—Normal and Abnormal Fear. Abraham Myerson, M.D., Professor of Neurology, Tufts College Medical School.

March 30—"Nerves"; Their Meaning in Our Lives. E. van Norman Emery, M.D., Medical Director, Connecticut Society for Mental Hygiene.

March 20—The New England Roentgen Ray Society. See page 577, issue of March 12.

March 23-27—Fifteenth Annual Clinical Session of the American College of Physicians. See page 240, issue of January 29.

March 24—Harvard Medical Society. See notice above.

March 24—Harvard Medical School. Lecture by Professor Heinrich Wieland. See notice above.

March 25—Boston City Hospital, Clinical Meeting. See page 632.

March 26—Medical Clinic at the Peter Bent Brigham Hospital. See page 631.

March 26—The Beth Israel Hospital Pediatric Club. See page 632.

March 27—Belmont Medical Society. See page 577, issue of March 12.

April 1-June 3—Cardiac Course. See page 854, issue of October 23, 1930.

April 8—New England Dermatological Society. See page 632.

April 10—The William Harvey Society. See page 471, issue of February 26.

May 11-14—Meeting of the National Tuberculosis Association at Syracuse. See page 1310, issue of December 25.

June 8-14—International Hospital Congress. See page 521, issue of March 5.

July 6-11—Medical Clinic, Paris. See page 520, issue of March 5.

July 26-31—Third Congress of the Pan American Medical Association. See page 632.

July 27-31—Third International Congress of Radiology, Paris. Complete notice appears on page 385, issue of August 21.

September 14-17—The American Public Health Association. See page 632.

DISTRICT MEDICAL SOCIETIES

Bristol North District Medical Society

April 16—Taunton Woman's Club.

September 17.

Essex North District Medical Society

The next meeting will be held at the Amesbury Country Club early in May.

Essex South District Medical Society

Thursday, May 7—Censors meet at Salem Hospital at 3:30 P. M.

Tuesday, May 12—Annual Meeting. The Tavern, Gloucester. Speaker: Dr. Morris Fishbein, Editor of the A. M. A. Journal of Chicago. Subject: "History of Medical Cults." Ladies invited.

Franklin District Medical Society

May—The meeting will be held on the second Tuesday of May at 11 A. M. at the Weldon Hotel, Greenfield.

Middlesex East District Medical Society

May 13—At Wakefield.

Norfolk District Medical Society

March 31—Dr. Arthur W. Allen. Subject to be announced (will deal with circulatory diseases). Hotel Kenmore, 8 P. M.

May—Annual Meeting. Date and details to be announced.

May 7—Censors' Meeting for examination of candidates at 171 Warren Street, Roxbury, 4 P. M. Candidates from schools on accepted list will forward application with certificate of graduation to the secretary at least one week prior to date of examination. Candidates from schools not on accepted list who have been in practice five years will forward applications together with five letters of recommendation from members in good standing in the Massachusetts Medical Society to Dr. P. P. Johnson, Cabot Street, Beverly, Mass., two weeks prior to date of examination. Fee for all candidates $10.00.

FRANK S. CRUICKSHANK, Secretary.

Norfolk South District Medical Society

Spring meetings are as follows:
April 2, May 7.
All meetings begin at 12 noon. Meetings will be held at the Norfolk County Hospital, South Braintree.
The censors will meet on May 7 at 11:30 A. M. at the Norfolk County Hospital, South Braintree.

NATHAN R. PILLSBURY, Secretary.

Plymouth District Medical Society

March 24—See page 632.

Suffolk District Medical Society

March 25-April 29—Combined meetings with the Boston Medical Library. These meetings will be held as specified below on Wednesdays, at 8:15 P. M.

March 25—Clinical Program, Beth Israel Hospital.

April 29—Annual Meeting. Election of Officers. Boston Medical Library.

The medical profession is cordially invited to attend all of these meetings.

GEORGE S. DERBY, M.D.,
President, Suffolk District Medical Society.

LELAND S. McKITTRICK, M.D.,
Secretary, Suffolk District Medical Society.

HILBERT F. DAY, M.D.,
Boston Medical Library.

BOOK REVIEWS

The State Health Departments of Massachusetts, Michigan and Ohio, with a summary of Activities and Accomplishments, 1927-1928. By JAMES WALLACE, M.A., M.D., C.P.H. New York: The Commonwealth Fund, Division of Publications, 1930. Price $1.50.

This publication of 192 pages was sponsored by the Committee on Administration of the American Public Health Association. It is stated to have resulted from requests to the Committee for "studies of the organization of State Health Departments".

The book really goes beyond a consideration of the public health administration generally in these three States, and presents the matters considered so as to facilitate comparisons and contrasts. Statistical data contribute to this end. In the successive chapters there are treated so as to be easily compared, the history and organization of the three State Health Departments, their relations to local government and local public health work, the departmental methods of administration in general, and in particular in handling communicable diseases, venereal diseases, tuberculosis, sanitary engineering, laboratories, hygiene, the control of milk, food and drugs, and sanitary inspection. The book concludes with the consideration of health education, appropriations and relative efficiency, as indicated by the conventional "appraisal" tests.

In the difficult task of presenting a survey effectively, the author has given us an exceptional product. In literary composition, it is also unusual.

Mistakes and omissions are of course discoverable. They are inevitable when one goes into strange territory on a mission of this sort. For example, those familiar with public health administration in Massachusetts will note that the author misses entirely the part which the Massachusetts Association of Boards of Health has played in preventing serious diversity in local public health practices which the author apparently assumes to have resulted from the ancient independence of local health officials in this State.

In other respects, too, the book betrays the difficulties which a stranger encounters in making a survey. The real efficiency of any organization depends more upon the personality of the chief executive, his inborn executive ability and capacity for leadership, than upon the legal set-up of his organization. An experienced public health officer will note a lack of clarity in the language in certain places in the book where the relation of State Health Departments to local health administration is being considered, suggesting that the author is aware that the State Department is exerting an influence beyond its statutory authority, but is unable to tell just how it is being so effectively exerted.

The serious shortcomings of the book appear from a consideration of the intention to use it as a textbook in public health administration. In the foreword, it is stated that the book is intended "for teaching purposes in institutions training men for local public health work". Its usefulness for such purposes has marked limitations and it is capable of being used to do more harm than good.

The objections to the book arise chiefly from the fact that the author's conception of a survey is derived from the popular model which has developed from the usual motive of a "health survey," to discredit some local official, or to help in obtaining bigger appropriations to pay the cost of new "activities" and an increased personnel, or perhaps merely to give the *surveyor* something to do. The conventional survey model for presenting approved features of public health administration is calculated to focus attention upon them, as performances to be imitated, a method followed by specialists in the instruction of the feeble-minded, but not deemed proper for the normal who are supposed to be taught to reason. In this proposed textbook on public health administration, one finds no intimation that ill-advised legislation tends to anarchy; that thoughtful consideration should be given to possible inconsistencies with the organic law of a state before advocating health promotion legislation which has apparently been successful somewhere else.

The book neglects an opportunity to show that attempts in Massachusetts to compel cities, towns or counties by edicts of the Legislature to create and maintain tuberculosis hospitals of a prescribed capacity have never been successful because such edicts have violated the basic principles of the government of the State.

Before such legislation was started some localities had already provided hospitals of the character contemplated and some have built them since but State officials have found themselves powerless to enforce these legislative edicts where local officials have declined to act.

From the author's presentation of the relations of State Health Department and local jurisdiction in health matters the student might justifiably infer that without giving thought to changes in the organic law of a State, the obvious objections to local independence in certain public health matters might be remedied by merely vesting a State officer with statutory authority to see that what he thinks desirable is done and leaving the consequences, costs and liabilities, municipal and personal, to the town and its officials.

In the discussion of working methods also the book is likely to mislead the student, not so much by what is said as by leaving unsaid what is equally important to an intelligent understanding of the subject under consideration.

For example, in connection with public health administration in Massachusetts, the author credits Dr. Haven Emerson and Dr. M. P. Horwood with having "found" that in Boston 16.7 per cent. of tuberculosis deaths were reported as cases one month before death and 19.7 per cent. of them after death. No exception is to be taken to the inference that this was a situation capable of being improved by different administrative methods, but a textbook intended to give a student a clear conception of the tuberculosis problem should tell the whole truth and go on and say that for some seven years previous to this discovery by

the above-named investigators the Boston Health Department had been publishing regularly in its monthly bulletins and annual reports tables showing the time elapsing between the date of reporting fatal cases of pulmonary tuberculosis and date of death. The Boston Commissioner hoped that the advertising of the actual situation might in conjunction with other efforts, bring about the earlier reporting of cases. The hope was vain. The proportion of cases not reported until within a month of death increased from about 25 per cent. to nearly 40 per cent. In the meantime, however, the death rate from tuberculosis went on showing the same tendency to decrease that it had been doing for at least seventy years. It seems impossible that opportunities for infection had decreased. Circumstantial evidence indicates that in Boston, as was found in Framingham, about one per cent. of the population are spitting tubercle bacilli. The only tenable conclusion seems to be that for some reason, important to discover, in an increasing proportion of instances, tuberculous infections in Boston do not become dangerous. Perhaps they may even serve as beneficent inoculations. Such observations must be published in textbooks for health officers, not ignored, if it be intended that the tuberculosis problem shall receive rational consideration.

While the book purports to consider the organization of three State Health Departments, it really attempts to do much more and its failure to mention economic conditions, local customs, occupations, and other factors in determining the health of a community tends to strengthen in students the prevalent erroneous idea that satisfactory public health is entirely the product of organized health promotion "activities". Its application of the approved "appraisal" tests of administration efficiency tends in the same direction. For example, in the author's illustrative applications of "appraising" administative efficiency, an abrupt fall in deaths from typhoid fever and in infant mortality, due unmistakably, to the introduction of a safe water supply and pasteurized milk, and a steady decline in deaths from tuberculosis or scarlet fever, clearly the result of the operation of some natural biological process, all go to the credit of public health "activities".

Or, to take scheme of estimating efficiency in the control of communicable diseases in general, the apparent extent to which they are "reported", the ratio of reported cases to recorded deaths and official "visits" are construed as serving to measure administrative efficiency.

In a large American city, with a mixed population and foreign-born elements, a case of scarlet fever, for example, does not usually come to official attention until it has been contagious for five or six days, often with the prevailing mild form of the disease, not until desquamation appears, at any rate after infected contacts have also become contagious. Any rational being who has experience with a contagious disease among susceptible people knows that in the above described circumstances a decreasing statistical morbidity and mortality from scarlet fever is due to something besides the usual and approved official practices in dealing with this disease.

There was a time when a public health official had to plead hard for appropriations and then show what he had done to justify them. Now a local health officer finds himself pushed into dubious undertakings by emotional women and men whose motto is that "activities" with any laudable purpose in view are alone sufficient to justify appropriations. A person who suggests that a public health promotion "activity" may be futile is made to feel the same scornful reproaches as the man who in 1917 questioned the advisability of spending millions to build wooden ships "to help win the war".

This is not a healthy situation. The present prices of Australian government, state and municipal bonds, warn us of the consequences of ill considered human welfare promotion projects. A present day American health official, morally responsible for a business-like expenditure of public funds, is being embarrassed by "surveys" designed to prop up this or that public health promotion procedure as something to be worshipped like a heathen's idol. He has, nevertheless, the greatest need of studies broad enough in their scope to enable a rational being to judge for himself whether the public which is paying for having its health promoted is really getting its money's worth, whether an "activity" which has received the sanction and blessing of "public health authorities" is capable of producing results that will justify its cost.

To serve this purpose, a survey must do something more than to compare conditions in three states which are trying to do the same things in the same ways. A State or a City which assumes that it is thus accomplishing results must be checked up by "controls" which are doing nothing at all. Comparisons must be made between places whose economic and climatic conditions and the racial composition and habits of the people are different as well as nearly the same. A new kind of survey is needed which will always regard statistics as untrustworthy until their creditability can be affirmatively established. All facts brought out by a lavishly endowed "health demonstration" must be disclosed—those that are unfavorable as well as favorable to the ideas which may have inspired such a project.

To go back again to scarlet fever for a specific example. More laboratory work and a broad geographical study of scarlet fever, an investigation of its disappearance in a recognized form in places where natural immunity is indicated by the Dick test, are needed to help the local health officer to find a way to discard the pretense of controlling the disease by quarantining cases after they have done all the harm that they are likely to do. Or, in referring to tuberculosis again health officers are "fed up" on tuberculosis surveys which offer them the choice of recommending expenditures that threaten municipal solvency, or being branded as unprogressive, incompetent officials.

What a health officer really needs is the benefit of tuberculosis surveys in places where no approved

anti-tuberculosis procedures have been in operation, yet the tuberculosis death rate has shown a noteworthy decrease. It might help him if he could secure from different investigators more information about tuberculosis in Germany and in Porto Rico, as well as in Michigan and Ohio. He might profit from more studies directed to the discovery of the ultimate specific factors in poor economic conditions which run up tuberculosis mortality. He would like to hear something about the part which concurrent streptococcus infections play in making a tuberculous infection dangerous as well as about toxic sugars generated by the tubercle bacillus itself. He would like to see fewer indications of hostility and prejudice in the appraisals of attempts to immunize artificially against tuberculosis even though adverse conclusions may be entirely justifiable. He needs, in fact, a wider appreciation of his actual needs and a clearer realization on the part of his self-appointed instructors that a responsible official in "local public health work" has to deal with intelligent men who do not believe that the ideal in tuberculosis prevention is the creation of a breed of beings, whether human or cattle, who have never been exposed to infection, but rather that a solution of the tuberculosis problem awaits the successful imitation of Nature's method of immunization.

Bioassays—A Handbook of Quantitative Pharmacology. By JAMES C. MUNCH. The Williams & Wilkins Company, Baltimore, 1931. Price $10.00.

Unless our conception of the word "Handbook" is incorrect, this book is wrongly titled. We have always felt that a handbook was a manual—something always to have at hand and containing working directions. This book, on the other hand, is a review of the literature of biologic assays of drugs and other therapeutic agents and contains only a short chapter on the actual methods for testing these agents. The book contains a chapter on experimental technic, but it comprises only twenty-five pages and would be of very limited value to any one who actually desired to carry out physiological assays. There is a chapter on interpretation of results which is of value in evaluating the results of the tests. There are also chapters on drugs affecting the nervous system, those affecting circulation, respiration and the muscles. There are other chapters on bioassays of glandular products and of special types of drugs including biologic products. There is also a chapter on vitamins. There is a valuable appendix, which gives in tabular form the bioassay standards of the various drugs which are now tested by physiological methods.

It is, however, as a reference book that this volume serves a valuable purpose. The author has performed a prodigious task in collecting and abstracting some seventeen thousand references, which previously have been scattered through a great variety of scientific journals. For the first time, so far as we know, this book, therefore, brings together the results of years of research in the rapidly growing field of bioassay. The book is well printed and bound and has an unusually complete index including an index of tables, animals and test substances, and subjects. For any one engaged in the physiological testing and standardization of drugs, glandular extracts and vitamins, this work should prove to be of great value.

Surgical Emergencies in Practice. By W. H. C. ROMANIS, M.A., M.B., M.Ch., F.R.C.S., F.R.S., and Philip H. Mitchiner, M.D., M.S., F.R.C.S., 608 pages. William Wood & Co., New York, 1931. Cloth, $6.00.

In their preface, the authors outline the plan of their book as follows:

"We have tried to set out briefly and lucidly the clinical signs, differential diagnosis, and what we believe to be the best method of treatment in the surgical emergencies likely to be met with by the practitioner. . . . The main features of operative technique and the various steps in the ordinary emergency operations are given. . . . It has proved a difficult task to decide what to include within the scope of the term 'emergency', but our guide has been roughly those conditions which require active treatment (not necessarily operative treatment) within forty-eight hours."

They have succeeded extraordinarily well in their task. The brevity and lucidity are especially commendable. The entire field of traumatic surgery is completely covered. One looks in vain for omissions. Similarly the surgical treatment of acute diseases is presented fully. The fields of the specialties are covered in separate chapters; orthopedics, otolaryngology, neurosurgery, thoracic surgery, and urology. The only omissions are ophthalmology and obstetrics, realms which the general surgeon rightfully hesitates to enter.

It is always interesting, in examining European textbooks, to look for differences in methods of treating common conditions. Such differences are most marked in the present volume in the chapter on the treatment of fractures, although none of the divergences from American methods are of any great significance. In regard to the open reduction of supracondylar fractures of the humerus, the authors state, "This is an operation which can be carried out with safety by the practitioner in the operating theatre of any cottage hospital." Such a statement cannot fail to make one envious not only of the standards of training of English practitioners but also of the operating room technique of the cottage hospitals.

Indeed, the ideal practitioner for whom the book was written gradually assumes the aspect of a superman, as one follows him from a mastoid operation to a laparotomy for ruptured spleen, or from operative reduction of a fracture to drainage of a brain abscess. This statement is not to be construed as an adverse criticism of the work. The book is designed for emergencies, and if the occasion should arise for a urologist to treat a fracture, or for an orthopedist to deal with brain abscess, he would surely be well advised, to survey briefly the unfamiliar field in these pages.